

Université de Montréal

Profils de santé mentale des jeunes Québécois agressés sexuellement : comorbidité et trauma complexe

par  
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## Résumé

En termes de santé mentale, les jeunes agressés sexuellement forment un groupe hétérogène. Les quelques études de profil ont employé des devis transversaux et des mesures autorapportées, et ne s'attardaient pas spécifiquement à la comorbidité de diagnostics en santé mentale. Les objectifs du présent projet étaient de déterminer 1) si les jeunes agressés sexuellement pris en charge par le directeur de la protection de la jeunesse (DPJ) recevaient davantage de diagnostics en santé mentale uniques et comorbides, que les jeunes de la population générale et 2) les profils de comorbidité des jeunes agressés sexuellement au cours de 10 ans de consultations médicales et d'hospitalisations. Parmi les jeunes agressés sexuellement, l'impact de la maltraitance a aussi été exploré. Les diagnostics en santé mentale de 882 jeunes dont le signalement d'agression sexuelle avait été jugé fondé par le DPJ entre 2001 et 2010 ont été comparés à ceux de 882 contrôles pairés (N=1764). Les résultats des modèles linéaires généralisés mixtes démontrent que les jeunes agressés sexuellement présentent un plus grand nombre de diagnostics en santé mentale et sont quatre fois plus à risque de présenter des diagnostics comorbides. Des analyses de classes latentes chez les jeunes agressés sexuellement dressent quatre différents profils; deux plus sévères nommés trouble de stress post-traumatique complexe (CPTSD; 11%) et dissociation (14%); et deux moins sévères nommés dépression (10%) et faible ou aucune comorbidité (65%). Plus la cooccurrence de maltraitance et le nombre d'années de suivi étaient grands, plus les jeunes étaient à risque de présenter un profil de comorbidité élevée. Les profils de santé mentale des jeunes dans la classe avec le plus de comorbidité s'apparentent à ce que l'on définit comme le trauma complexe.

*Mots-clés* : maltraitance à l'enfance, agression sexuelle à l'enfance, TSPT complexe, comorbidité (ou cooccurrence), psychologie clinique

## Abstract

Sexually abused youth are a heterogeneous group in terms of mental health. The few studies profiling these youth often use transversal designs and self-reported measures, and aren't specifically focused on comorbidity of mental health diagnoses. The current study's objectives were to determine 1) if sexually abused youth under child protective agencies (CPA) were given more unique and comorbid mental health diagnoses than youth from the general population, 2) the comorbidity profiles of sexually abused youth over 10 years medical consultations and hospitalizations. Among the sexually abused group, the impact of cumulative maltreatment was also explored. The mental health diagnoses of 882 youth with a substantiated sexual abuse report between 2001 and 2010 at a participating CPA were compared to 882 matched controls (N=1764). Results of generalized linear mixed models showed that sexually abused youth presented higher rates of all types of mental health diagnoses and were up to four times more likely to present comorbid diagnoses. Latent class analyses among abused youth revealed four different comorbidity profiles; two more severe groups named complex post-traumatic stress disorder (CPTSD; 11%) and dissociation (14%); and two less severe groups named depression (10%) and low or no comorbidity (65%). Youth with more cumulative maltreatment and greater number of years of data following CSA report were more at risk of presenting a comorbidity profile. Mental health profiles of youth in the highest comorbidity class were similar to what is defined as CPTSD.

*Keywords:* child maltreatment, child sexual abuse, complex PTSD, comorbidity (or co-occurrence), clinical psychology

## **Définitions d'acronymes**

CSA: Child sexual abuse

CPA: Child protection agencies (agency)

PTSD: Post-traumatic stress disorder

CPTSD: Complex post-traumatic stress disorder

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## Dédicace

Cet ouvrage est dédié à tous (tes) celles et ceux qui ont été touchés (es) par l'agression sexuelle à l'enfance, de quelque façon. Notamment celles et ceux qui s'y intéressent au niveau clinique comme en recherche, qui oeuvrent dans le domaine - tant auprès des survivants (es) que des agresseurs (es), qui sont acteurs de changements sociaux, qui sont à la tête de nos institutions publiques et bien sûr, celles et ceux qui conçoivent les assises des réglementations sociales visant à protéger l'intégrité psychique et physique, ainsi que la dignité de nos enfants et adolescents. Mais bien plus que tout, cet ouvrage est dédié aux survivants (es) de l'agression sexuelle à l'enfance. Puisse nous continuer à apprendre et à comprendre, afin d'agir plus vite.

## Remerciements

J'aimerais d'abord remercier ma directrice Isabelle Daigneault pour son accompagnement soutenant et ses judicieux conseils tout au long de cette grande aventure doctorale. Je suis fort reconnaissante de toute ton implication et de ta patience à chacune des étapes de mon cheminement, aussi sinueux fût-il! Merci à mes parents si aimants qui m'ont toujours encouragée à poursuivre mes rêves, m'ont aidée à les rendre possibles et m'ont inspirée à être passionnée par mon travail. Vous m'avez transmis des valeurs essentielles comme la persévérance, le dépassement de soi et l'empathie. J'aimerais également remercier ma grande amie et collègue Élyse Porter-Vignola sans qui le quotidien de la rédaction n'aurait pas été aussi drôle, agréable ou motivant. Gus et toi avez été toute une soupape ... merci de ta grande humanité, et de ton esprit vif et curieux. Merci aussi à toutes mes collègues du laboratoire TRAJETS pour leur précieuse entraide; à Pierre McDuff d'avoir rendu les statistiques plus compréhensibles, et ce, avec humour; à Martine Hébert d'être une collaboratrice et chercheuse si inspirante. Enfin, et surtout, merci à mon amoureux et mon grand complice David Pelletier-Burns d'avoir été mon ancrage malgré vents et marées, mais aussi d'avoir partagé et souligné chacune des réussites. Tu as inconditionnellement, malgré mes propres découragements, cru en moi. Je t'aime plus que tout.

### **Préface à l'article**

Je suis l'auteure principale de l'article, car mon apport à sa rédaction est largement majoritaire. J'ai développé la question de recherche, effectué la recherche de littérature, choisi les variables à l'étude parmi une banque de données déjà établie par ma directrice de recherche, élaboré la grande partie de la syntaxe, interprété, illustré et discuté les résultats, tirer les conclusions et proposé les directions futures. Les analyses secondaires présentées dans cet article sont issues d'une banque de données préalablement obtenues par ma directrice de recherche, Isabelle Daigneault, qui a été présente à chacune des étapes de conception de l'article et a grandement contribué à son amélioration, tant au niveau de la structure que du contenu. Ses commentaires et conseils ont souvent été intégrés à mes écrits. Martine Hébert a participé à l'élaboration du projet de recherche initial et est demeurée une collaboratrice de par son expertise en agression sexuelle à l'enfance. Pierre McDuff, en plus de son immense travail sur la banque de donnée, a été un support au niveau statistique, particulièrement pour effectuer les analyses de classes latentes et ensuite en interpréter les résultats.

**CHAPITRE I**

Mental Health Profiles of Sexually Abused Youth: Comorbidity  
and Complex PTSD

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**Mental Health Profiles of Sexually Abused Youth: Comorbidity and Complex PTSD****Introduction**

Although child sexual abuse (CSA) is a major worldwide problem with social, public health and safety as well as economic impacts, it remains difficult to comprehend its full extent for two reasons: 1) a lack of consensus on how to define CSA and 2) important differences in how data is collected (Goldman & Padayachi, 2000; Johnson, 2008; Mathews & Collin-Vézina, 2017). Despite this, international data suggest that 12.7% of individuals report having been sexually abused before the age of 18 (Stoltenborgh, van Ijzendoorn, Euser, & Bakermans-Kranenburg, 2011). Prevalence rates usually vary around 18% for women, and 8% for men. Importantly, a great lack of congruence between low rates of CSA official institutional reports, and high rates of youth and adult self-reports has been widely documented (Stoltenborgh et al., 2011). Indeed, this comprehensive meta-analysis suggests the prevalence of CSA to be 30 times greater than what is reported to authorities, such as in the case of child protection agencies (CPA). Furthermore, it also has been demonstrated that self-reported CSA prevalence is higher, up to 35.8 - 38 %, in youth within CPA populations (Collin-Vézina, Coleman, Milne, Sell, & Daigneault, 2011; Pauze et al., 2000).

**Consequences of child sexual abuse**

It is generally accepted that CSA leads to detrimental psychological or psychiatric consequences, and appears to be a non-specific risk factor for higher rates of psychiatric diagnoses in adulthood (Gilbert et al., 2009; Maniglio, 2009) as well as during childhood and adolescence (Daigneault, Hébert, Bourgeois, Dargan, & Frappier, 2017; Fergusson, Boden, & Horwood, 2008). Adverse childhood experiences like CSA account for 31–65% of the risk for developing mental health disorders in ages 4–12 years, 24 – 41% in ages 13 – 19 years and 17 –

41% in ages 20 – 29 years (Kessler et al., 2010). In others words, CSA increases the risk of psychiatric disorder by 2.5 fold (Fergusson et al., 2008). When CSA consequences are assessed in childhood or adolescence, sexually abused youth present a host of mental health problems (for reviews see : Finkelhor & Hashima, 2001; Kendall-Tackett, Williams, & Finkelhor, 1993; Putnam, 2003; Tyler, 2002). Higher rates of internalised (eg. anxiety, depression) and externalised problems (eg. antisocial behaviour), suicidal ideations, substance use and other psychiatric diagnoses (Choi et al., 2017; Fergusson et al., 2008), such as post-traumatic stress disorder (PTSD) and dissociation or psychosis (Bourgeois, Lecomte, & Daigneault, 2018), are linked to CSA. When assessed in young adulthood very similar consequences are reported, with study results repeatedly observing higher risks for depression and anxiety, risk taking behaviours, self-esteem impairments, PTSD, substance use and general psychiatric symptomatology when compared to non-victims (for reviews: Hillberg, Hamilton-Giachritsis, & Dixon, 2011; Maniglio, 2009).

Although CSA doesn't seem to lead to consequences that are specific or unique, PTSD remains the most studied outcome (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Putnam, 2003), maybe because it considers CSA as a possible aetiology (Hyland, Shevlin, McNally, et al., 2016), and is among the most common disorders observed in sexually abused children and adolescents (Choi et al., 2017; Kendall-Tackett et al., 1993). Results of a meta-analysis report that 21 to 50 % of young victims of CSA present PTSD symptoms (Kearney et al., 2010), and these rates can increase to 90% in a clinical setting (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Kearney et al., 2010; Paolucci, Genuis, & Violato, 2001). Among youth under CPA care, about one fourth present clinical levels of PTSD symptoms (Collin-Vézina et al., 2011; Daigneault, Cyr, & Tourigny, 2003).

Much research focuses on PTSD as a consequence of CSA (Kearney et al., 2010; Naar-King, Silvern, Ryan, & Sebring, 2002; Putnam, 2003), and some studies have assessed various disorders comorbid with PTSD like depression and suicidality (Brosbe, 2014; Oquendo et al., 2003). However, there is a need to specifically study wider co-occurrence of disorders, or comorbidity, as a consequence of CSA.

### **Symptom comorbidity**

Some sexually abused children and adolescents tend to present complex adaptation profiles (Collin-Vézina et al., 2011; Daigneault, Tourigny, & Cyr, 2004; Tremblay, Hébert, & Piché, 2000) that could better be understood using a conceptualization based on complex post-traumatic reactions (Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Cloitre et al., 2009; Cook et al., 2005; Ford, 2011; Hyland, Shevlin, Elklit, et al., 2016; van der Kolk, 2017). Adolescents exposed to CSA present more comorbid mental health problems like PTSD, depression and suicidality than other youth who have not been sexually abused (Kilpatrick et al., 2003; Martin, Bergen, Richardson, Roeger, & Allison, 2004), even within those receiving psychiatric care who tend to present an array of complex psychological and behavioural disorders (Brand, King, Olson, Ghaziuddin, & Naylor, 1996; Ford, Gagnon, Connor, & Pearson, 2011; Naar-King et al., 2002; Silverman, Reinherz, & Giaconia, 1996). Among sexually abused youth with PTSD symptoms, specific comorbidities have been documented (Ackerman et al., 1998; Brosbe, 2014), such as internalized disorders (Brady & Caraway, 2002; Connor, Doerfler, Toscano, Volungis, & Steingard, 2004), and externalized disorders (McLeer et al., 1998), but studies tend to measure only two or three different diagnoses at a time (Kaplow, Hall, Koenen, Dodge, & Amaya-Jackson, 2008).



Hence, sexually abused youth that present an array of different problems, usually corresponding to more than one different diagnostic category, can be attributed multiple diagnoses. The concept of complex trauma, developmental trauma disorder, or of complex PTSD (CPTSD; Cloitre et al., 2013; Hyland, Shevlin, McNally, et al., 2016) might be useful in explaining why some youth present various symptoms that can initially seem distinct, but better understood as a complex consequence of CSA. The diagnostic nature of this concept has been studied over the past decade and remains a controversy among researchers (Rosen & Lilienfeld, 2008) although recent studies consistently show CPTSD to be distinct from PTSD (Cloitre et al., 2013; Hyland, Shevlin, McNally, et al., 2016) and valid (Hyland, Shevlin, Elklit, et al., 2016). Currently, the diagnosis of PTSD includes three groups of symptoms: (a) re-experiencing, (b) avoidance, and (c) increased arousal and hypervigilance (WHO; World Health Organization, 2016). The proposed symptom profile of CPTSD includes all PTSD symptoms, plus an additional three categories that identify disturbances in self-organization, which may result from sustained and repeated interpersonal trauma. These categories are: (a) affective dysregulation, (b) negative self-concept, and (c) disturbed relationships (Ford & Courtois, 2014; WHO 2016).

The use of person-centered analytic techniques, such as latent class analysis is gaining interest in determining whether there are distinct mutually exclusive groups of individuals based on reported experiences of maltreatment (Rivera, Fincham, & Bray, 2018), reported psychiatric diagnoses in CSA victims (Brodbeck et al., 2018) or trauma-symptoms (Gallitto, Lyons, Weegar, Romano, & Team, 2017). Indeed, some studies have tried to better understand how CSA victims can be distinguished among themselves and in comparison to non-sexually abused individuals. Although there is vast heterogeneity, general findings suggest three to four distinct profiles with an incremental range in the severity of consequences between groups, as well as a dose-response

association between the severity of CSA or maltreatment and symptoms (Brodbeck et al., 2018; Hébert, Parent, Daignault, & Tourigny, 2006; Shin, Hong, & Hazen, 2010). Most of these studies used cross-sectional designs and small samples, which limits the ability to determine the timing of events (diagnoses and CSA) and statistical power.

**Maltreatment co-occurrence**

The growing research focusing on the effects of interpersonal trauma within child welfare involved youth (Daigneault et al., 2003; Tanaka, Wekerle, Schmuck, & Paglia-Boak, 2011; Wekerle, Goldstein, Tanaka, & Tonmyr, 2017) shows that adolescents involved in CPA have higher rates of serious mental health disorders compared with the general adolescent population. Furthermore, it has been found that among youth under CPA care, more than half had experienced more than four types of victimization in the past year (Cyr et al., 2013). Between 22% and 90% of maltreated youth or those involved in child welfare (Lau et al., 2005; Tourigny, Hébert, Joly, Cyr, & Baril, 2008; Turner, Finkelhor, & Ormrod, 2010) and up to 69% in the general population report polyvictimisation or cumulative traumatic experiences (Felitti et al., 1998; Finkelhor, Ormrod, & Turner, 2009; Finkelhor, Shattuck, Turner, & Hamby, 2015; Ford, Elhai, Connor, & Frueh, 2010). Sexually abused youth are also at risk of experiencing other types of maltreatment such as abandonment, neglect and physical abuse (Finkelhor, Ormrod, Turner, & Hamby, 2005; Scott-Storey, 2011). Although CSA is reported less frequently than other types of maltreatment (Brown, Rienks, McCrae, & Watamura, 2017; Stoltenborgh et al., 2011) it occurs rarely in isolation (Vachon, Krueger, Rogosch, & Cicchetti, 2015). Furthermore it has been associated with a three-fold greater weight than maltreatment alone and than all victimization types in predicting short and long-term psychological consequences (Finkelhor et al., 2009). Furthermore, it is now documented that there is a dose-response effect when

considering the consequences of cumulative maltreatment, where the higher the number of distinct types of maltreatment is associated with a greater number of symptoms of current distress (Finkelhor et al., 2009; Steine et al., 2017).

**Specific aims and hypotheses**

The first aim of this study is to document the prevalence of comorbid diagnoses of mental health disorders in the administrative databanks of universal public health insurance agency of children and adolescents up to 13 years following a substantiated sexual abuse report, compared with the same diagnoses in a matched group from the general population. The second aim is to document the comorbidity profiles of these youth and underline the characteristics that distinguish them such as gender, age at CSA report as well as cumulative maltreatment in addition to CSA. The current study will palliate limits of previous study designs by using a prospective design, while controlling for mental health problems preceding the CSA report substantiation.

Current literature allows us to generate the following hypotheses: 1) the group of sexually abused youth will present more mental health disorders in all diagnostic categories and 2) higher rates of comorbid mental health disorders than the general population. Furthermore, we expect to observe at least three distinct groups within sexually abused youth (Hypothesis 3): youth without diagnoses, youth with only one diagnosis, and youth with two or more different diagnoses. Groups of sexually abused youth with the highest comorbidity are also expected to have the highest rates of cumulative maltreatment when compared with abused youth presenting no comorbidity or no mental health disorder diagnoses (Hypothesis 4).

## Materials and method

### Data and sample

The current study selected all children who had a substantiated report of sexual abuse at a large urban CPA in Canada between January 1, 2001, and December 31, 2010. They form the sexually abused group ( $n = 955$ ). Personal information from the administrative databases of the universal public health insurance agency was matched to those from the CPA for 882 (92%) of the 955 children with substantiated sexual abuse by using participants' health insurance number, or their surname, name, and complete address and date of birth. The Canadian public health system covers all Canadian citizens, those currently residing as well as authorized foreign nationals, with their accompanying spouses and children. It is likely that misspelling of administrative data (i.e. names, surnames and addresses) could explain unmatched cases. Recent results using this same database indicated that excluded unmatched sexually abused cases received less services than matched sexually abused cases, suggesting less severe diagnostic profiles (Daigneault, Vézina-Gagnon, Bourgeois, Esposito, & Hébert, 2017).

To form the control group, each of the sexually abused participants ( $n=882$ ) was paired to another youth from the administrative database of the province's universal public health insurance. The criteria used were birth month and year, gender attributed at birth, geographical area from which sexually abused participants were selected, and an indicator of the socio-economic level (i.e. eligibility to the province's prescription drug insurance plan). Bearing in mind that sexual abuse is grossly underreported to authorities (Afifi et al., 2015), even if no substantiated sexual abuse was reported during the 10 year recruitment at the participating CPA, there is no way of knowing with certainty if some participants were exposed to CSA within the control group. Furthermore, if reports were made, they could have been found unsubstantiated or

made to another CPA if children moved from one geographic area to another. In both cases, this information would not have been available in the current data set.

The final sample is composed of 882 children and adolescents for whom a sexual abuse report was substantiated within the CPA and 882 matched individuals from the general population whom did not have a substantiated report for CSA during the study at the participating CPA. Each of these two groups is composed of 661 girls (75%) and 221 boys (25%). This represents a total sample of  $N = 1764$ . The average age of the participants at the time of entry in the study (date of the substantiated report of sexual abuse to CPA) was 11.07 and previous analyses showed that boys were 1.4 years younger than girls at the time of the first CSA report (Daigneault, Vézina-Gagnon, et al., 2017).

In the sexually abused group, the number of different substantiated reports varied from 1 (40% of abused youth) to 4 (8%) ( $M=3.12$ ,  $SD=2.87$ ). This means that although CSA was the first substantiated report to CPA for most participants (88%), other maltreatment reports were also substantiated, whether prior to, after, or co-occurring with the sexual abuse, such as negligence (31%), physical abuse (10%), behaviour problems (8%) and abandonment (2%). At the end of the study, the principal reason for CPA involvement remained sexual abuse for most youth (60%). For some youth though, negligence (28%), maltreatment (5%), behaviour problems (5%) and abandonment (1%) became the principal reason for receiving CPA services.

### Measures

**Sexual abuse.** In the current study, sexual abuse was defined as “any gesture of a sexual nature, with or without physical contact, committed by an individual without consent from the person, or, in some cases, particularly that of children, through emotional manipulation or coercion” (MSSS, 2016). When a sexual abuse report is substantiated, it satisfies a series of

criteria. It must first be retained for evaluation. Then a social worker must assess if there is sufficient evidence to substantiate the CSA report and the case is either found to be 1) substantiated (sufficient evidence that CSA occurred), 2) suspected (suspicion of CSA but insufficient evidence to substantiate the allegations), or 3) unsubstantiated (enough evidence to refute CSA) (MSSS, 2008). The present study selected all children who had at least one substantiated report of sexual abuse between 2001 and 2010 at the participating CPA to form the group of sexually abused youth. To avoid duplication of reports and participants, the first substantiated report of sexual abuse was considered for each participant and determined his or her time of entry into the study. The control group, or matched group, included youth who resided in the same geographical area served by the participating CPA and most importantly, who did not have a substantiated report of sexual abuse between 2001 and 2010 at that same CPA (see procedures above for more detail on control group selection).

**Maltreatment co-occurrence.** For each sexually abused youth, data from the CPA was provided for all other substantiated reports on file, dating back to the first substantiated report and up until the end of the study December 31, 2013, which provides information on cumulative substantiated maltreatment. CPA considers the security or development of a child to be compromised if “the child is abandoned, neglected, subjected to psychological ill treatment or sexual or physical abuse, and unique to Quebec, if the child has serious behavioural disturbances” (MSSS, 2016). For the current study, a total score of all substantiated maltreatment reports were added to form a continuous variable ranging from 0 to 20.

**Mental health** (Table 1). All diagnoses of mental and behavioural disorders related to medical services received and hospitalizations occurring between January 1, 1996, and March 31, 2013, were documented from the universal public health insurance agency and the Ministry

of Health's administrative databases using the 10th version of the International Classification of Diseases (ICD; WHO, 2008). In the current study, the following categories were used: 1) disorders due to psychoactive substance use (ICD code F10-F19), 2) schizophrenia and delusion disorders (F20-F29), 3) disorders of the adult personality and behaviour (F60-F69), 4) disorders of psychological development (F80-F89), 5) unspecified mental disorder (F99), 6) depressive episodes and disorders (F32-F39), 7) bipolar disorders and manic episodes (F30-F31), 8) reactions to severe stress and adjustment disorders (i.e. post-traumatic stress disorder, acute stress reaction and adjustment disorder; F43), 9) anxiety disorders and phobias (F40-F42), 10) somatoform and dissociative disorders (F44-F48), 11) eating disorders (F50), 12) behavioural syndromes associated with physiological disturbances (F51-F59), 13) hyperkinetic disorders and 14) conduct, emotion or social functioning disorders with childhood onset (F91-F99). For each of the 14 diagnostic categories, a dichotomous score was computed documenting whether or not each participant had at least one medical consultation or hospitalization for a diagnosis in that category after the first substantiated CSA report. A comorbidity score was then calculated and varies from 0 to 14, with a higher score indicating greater comorbidity in distinct diagnostic categories following the CSA report.

**Control variables.** A deprivation index (material and social), based on postal code which indicates the socioeconomic level of the geographical area at the time of the first substantiated report of sexual abuse was used (Pampalon, Gamache, & Hamel, 2010) and controlled for in all analyses. The total number of medical services (consultations/hospitalizations) received for mental health issues between January 1<sup>st</sup> 1996 and the first substantiated CSA report, using the same diagnoses described previously, were also controlled for. Furthermore, consultations and hospitalizations for mental retardation/intellectual disability diagnosed before the first

substantiated report of abuse were controlled for since it's a known risk factor of sexual abuse and mental health disorders (Euser, Alink, Tharner, IJzendoorn, & Bakermans-Kranenburg, 2015). Finally, the number of years for which data could be collected for each participant, meaning number of years between first CSA report and end of the study, was also controlled for in subsample analyses of sexually abused youth. All analyses were conducted with the IBM SPSS 24 program (IBM Corp, Armonk, New York), with a  $P < .05$  significance level.

### Results

**Objective 1 (preliminary analyses).** Descriptive results presented in Table 2 show the percentage of participants who received services related to diagnoses in the fourteen categories described previously. The highest rates of diagnoses for both CSA and control groups fell within the categories of neurotic disorders (specifically anxiety and phobias), conduct and social disorders with onset in childhood and dissociation and somatoform disorders.

**Objective 1: Hypothesis 1.** To determine whether sexual abuse was associated to higher comorbidity for mental health disorders, a negative binomial regression using SPSS was used. This type of analysis is the most accurate to account for the matched-cohort design, whereby the identical values upon which the participants have been matched are eliminated from further consideration (Niven, Berthiaume, Fick, & Laupland, 2012). Results showed that, controlling for material and social deprivation, intellectual disability and mental health prior to the CSA report, sexually abused youth were 3.6 times more at risk (95% confidence interval [CI] 2.13 – 6.01) of presenting a mental health disorder in at least one diagnostic category than matched youth from the general population ( $F_{(1/1688)} = 15.41, p < .000$ ). One quarter of sexually abused youth presented very high comorbidity prevalence (22%; presence of at least one diagnosis in four or more different categories), compared to a minority in the general population (6%).



**Objective 1: Hypothesis 2.** Descriptive results in Table 2 indicate that comorbidity is much higher for sexually abused youth than for controls. Paired t-test results reveal that, on average, abused youth have significantly higher total comorbidity scores ( $M = 1.96$ ,  $SD = 2.47$ ) than their matched-control peers ( $M = 0.67$ ,  $SD = 1.31$ ; paired  $t_{(881)} = 14.11$ ,  $p < 0.001$ ).

**Objective 2: Hypothesis 3.** To document the comorbidity profiles of sexually abused youth a series of latent class analyses (LCA) were used. This analysis was solely performed on data from the sexually abused group because results showed comorbidity levels were not comparable between groups and there were too few participants with four or more diagnoses in the general population group. Additionally, variables on which to compare the profiles, such as cumulative maltreatment, were only available for the sexually abused youth. LCA postulates that the unobserved homogenous subgroups in a heterogeneous population can be identified using identifiable variables, in this case mental health diagnoses (Collins & Lanza, 2010). This means the LCA estimates the probability of a presence vs absence of a diagnosis according to latent class membership. The LCA also estimates how many participants are expected to belong to each latent class. Using SPSS version 24 and a poLCA model using R, LCA were based on the 14 dichotomous diagnostic category variables. To select the preferred model, we relied on the lowest value of the Akaike information criteria (AIC) and the lowest value of the sample-size adjusted Bayesian information criterion (BIC). Indicators like AIC and BIC have been shown to consistently demonstrate better fit of classes (Nylund, Asparouhov, & Muthén, 2007). The general practice of LCA is to test a sequence of models, increasing the number of classes, and to choose the best fitting model according to adjustment indicators. As presented in Table 3, adjustment indicators were compared for solutions between two and five classes, and a four-class solution was retained.

Results presented in Table 4 describe the probabilities for each class and Figure 1 illustrates these same probability profiles for each of the four classes. A first class (10.6% of abused participants), named “CPTSD” emerged, grouping participants who all (100%) had a diagnosis of conduct or social disorder as well as a high probability of presenting diagnoses in multiple distinct categories. More than half of abused youth in that class presented diagnoses in such the following categories: personality, depression, PTSD, unspecified, anxiety and phobias, somatoform and dissociation, as well as disorders with a physiological impact. Indeed, all participants had at least one diagnosis in four or more different categories, meaning all participants presented highly comorbid profiles of mental health. A second class (65.3%), named “no comorbidity”, represented all sexually abused youth with no diagnoses and some with a very low probability of presenting one or two? diagnoses. When compared to other classes, this second class is the largest and the one with least comorbidity. A third class (14%) regroups abused youth with the highest probability of presenting at least one diagnosis from the dissociative disorders category, as well as conduct and social or anxiety disorder categories. This class was named “dissociation”. A final and fourth class (10.1%) named “depression and physiological impact” grouped participants presenting mostly depressive disorders, physiological impact disorders and anxiety disorders.

**Hypothesis 4.** To determine if gender, number of years following first reported CSA and number of substantiated types of reported maltreatment were associated with highly comorbid profiles found in the latent class analysis, a multinomial regression was used.

Multinomial regression analyses were used to compare classes on gender, number of years between first CSA report and the end of the study, and the total number of reports substantiated by CPA during the study. Model fit was good ( $\chi^2 = 48.07(9)$ ,  $p < .000$ ) and results

showed that gender was not a predictor of class membership. Only two classes could be predicted by remaining variables. The dissociation class membership could be predicted by number of years following CSA, (relative risk = 1.11 ([CI] 1.01-1.19), SE = .04,  $p < .01$ ) and cumulative maltreatment (relative risk = 1.11 ([CI] 1.04-1.18), SE = .03,  $p < .001$ ). The CPTSD class membership could also be predicted by number of years following CSA (relative risk = 1.20 ([CI] 1.10-1.32), SE = .05,  $p < .000$ ) and cumulative maltreatment (relative risk = 1.15 ([CI] 1.07-1.23), SE = .03,  $p < .000$ ), with slightly higher relative risk ratios than for the dissociation class. This means that abused youth were more likely to belong either to the CPTSD class or to the dissociation class with each additional year of follow-up data available and with each additional cumulative substantiated maltreatment report to CPA, which was not the case for the two other classes (i.e. depression and no comorbidity). Percentages of comorbidity of diagnoses, cumulative maltreatment and gender by class membership are presented in Table 5.

### **Discussion and conclusion**

The current study had two objectives, namely to first document the prevalence of comorbid mental health disorders in the administrative databanks of the universal public health insurance agency of children and adolescents up to 13 years following a substantiated sexual abuse report and secondly, to identify trauma-related symptom profiles of these child-welfare-involved children and adolescents. Results have revealed that abused youth have a greater risk of presenting mental health disorder diagnoses (Hypothesis 1) and higher comorbidity (Hypothesis 2). They also revealed 4 distinct classes of comorbidity in the abused group (Hypothesis 3), which were subsequently associated with longer follow-up periods and cumulative substantiated reports of maltreatment (Hypothesis 4).

As expected, sexually abused youth presented significantly higher rates of all mental health disorders categories put together and higher comorbidity than youth from the general population. Youth exposed to CSA were almost four times more likely to receive at least one mental health diagnosis from their physician than their general population peers. This is coherent with other study results (Collin-Vézina et al., 2011; Kessler et al., 2010; Stoltenborgh et al., 2011). Results also showed that the highest prevalence in specific diagnostic categories for the sexually abused group was for anxiety and phobias, dissociation and somatoform disorders, and conduct disorders. This is coherent with past study results that have shown that CSA victims tend to present more childhood mental disorders, anxiety and acute stress disorders as well as conduct disorders (Spataro, Mullen, Burgess, Wells, & Moss, 2004). Almost a quarter of sexually abused youth presented at least one diagnosis in more than four different diagnostic categories, compared to a minority in the general population. Indeed, the varied and possibly highly detrimental impact of CSA on mental health has been shown previously (Fergusson et al., 2008) and was also found in the current study. We further investigated comorbidity profiles within sexually abused youth, which have shown to range from no comorbidity (0-1 diagnosis) to very high comorbidity (4-13 distinct diagnostic categories).

Documenting mental health comorbidity profiles of sexually abused youth revealed that they presented great heterogeneity, as shown by four different profiles (classes). We expected to find at least three different profiles so results are partially coherent with hypotheses in terms of number of profiles but also the characteristics that define these profiles. Indeed, we predicted 2 classes with little comorbidity (i.e. 0 diagnoses and 1-2 diagnoses) and found only one class (i.e. 0, 1 or 2 diagnoses; no comorbidity class), which was also the largest of the four classes. Furthermore, 2 other classes emerged of moderate severity (i.e. depression and dissociation).

Finally, as expected, we found a most severe class. The most severe class in terms of comorbidity was the one we named “CPTSD” class comprising 1 in 10 participants who all presented at least one diagnosis in at least five different categories. Interestingly, all participants had received medical services or been hospitalized for at least one diagnosis in the conduct or social disorder category. Oppositional defiant disorder (ODD) and reactive attachment disorder of childhood were among those found in this category and have previously been found to be comorbid to PTSD following CSA (Ackerman et al., 1998; Brosbe, 2014). Furthermore, with more than half of participants presenting diagnoses the disorder categories of personality, depression, PTSD, unspecified, anxiety and phobias, somatoform and dissociation, as well as disorders with a physiological impact, links can be made with the concept of CPTSD (Ford, 2011; Ford & Courtois, 2014; Hyland, Shevlin, Elklit, et al., 2016). Indeed the impact that trauma, like CSA, can have on systems of self-organization, specifically problems in affective, self-concept, and relational domains (Cloitre et al., 2013). The affective domain problems that are characterized by emotion dysregulation (e.g. heightened emotional reactivity, violent outbursts, reckless or self-destructive behavior, dissociation under stress) are difficulties also found in diagnostic categories of personality, conduct and social, as well as somatoform and dissociation disorders (WHO, 2008). Self-disturbances are characterized by negative self-concept whereby beliefs of worthlessness persist (Cloitre et al., 2013). These difficulties can also be found in categories such as depressive and personality disorders. Interpersonal disturbances are defined by persistent difficulties in sustaining relationships (Cloitre et al., 2013) and can be observed mainly in personality disorders, as well as conduct and social disorders. Furthermore, it is a fair assumption that youth with great comorbidity of mental health disorders might present such distress that it diminishes the quality of social relationships.

Participants in the “highest comorbidity” class also reported the highest levels of cumulative maltreatment compared to other classes. These results are coherent with our expectations, as it has previously been reported that a dose-response effect can be observed between cumulative maltreatment types and psychological consequences (Finkelhor et al., 2009). A recent study profiling boys has found similar results whereby males with most severe CSA profiles tended to report more emotional and physical abuse than males with less severe CSA profiles, and tended to present internalized, externalized and trauma symptoms in a dose-response manner pertaining to commutative maltreatment (Lyons, 2018). Results are furthermore indicative of what is defined as CPTSD (Cloitre et al., 2013; Hyland, Shevlin, Elklit, et al., 2016) whereby psychological disturbances and perturbed functioning can be observed in a variety of spheres and could be better explained in relation to interpersonal trauma.

In the “no comorbidity” class (65.3%), which was the largest class, more than half of abused youth hadn’t received medical services or been hospitalized for mental health problems, while the rest had for at least one diagnosis in a single diagnostic category. It was the only class comprising participants without diagnoses. This is similar to classes identified in previous person-centered study investigating community-based samples of trauma-exposed youth (53-58%, Ayer et al., 2011; Gallitto et al., 2017) and congruent with current literature on resilience following trauma and CSA among welfare involved youth (Collin-Vézina et al., 2011). Indeed, although CSA’s potential to have devastating impact on psychological health has repeatedly been demonstrated, a growing field of research also reveals that some individuals show little negative outcomes or even positive outcomes following trauma (Marriott, Hamilton-Giachritsis, & Harrop, 2014). Studies have generally reported around a third of sexually abused youth to be asymptomatic (Collin-Vézina et al., 2011; Hébert et al., 2006) and perhaps differences can be

explained by methodology such as self-reported information instead of administrative data, as is the case for this study.

Two other classes emerged from analyses, namely the “dissociation” class (14%) and the “depression” class (10%). Comorbid diagnoses were less prevalent than in the “highly comorbid” class although more than half of the participants in the “depression” class presented one or two diagnoses additional to depression. Relative to our initial hypotheses, these two classes indicate that there are more comorbidity profiles (with two or three diagnoses) than expected, and that these distinct profiles are moderate in severity.

The study documented both male and female victims, although no gender differences were revealed in analyses. Surprisingly, results showed that gender was not a significant predictor of mental health comorbidity. Indeed, although boys seemed to be slightly overrepresented in the two highest comorbidity classes compared with the other two classes, this difference was not significant. Although previous studies have found gender differences in the type of symptoms observed in children and adolescents (Collin-Vézina et al., 2011; Daigneault, Vézina-Gagnon, et al., 2017; Spataro et al., 2004), and specifically regarding PTSD in adults (Marx & Sloan, 2003), none have studied gender differences regarding comorbidity. Results suggested that although boys were slightly younger than girls when the CSA report was substantiated, and although previous results have shown they tended to receive more medical services than girls for psychological disturbances five years after the substantiated CSA (Daigneault, Bourgeois, et al., 2017), boys in the current study didn't present more comorbid diagnoses than girls. Such results are surprising considering participants in the “highly comorbid” class all presented at least one diagnosis in the conduct disorder category, and that we know from previous research that sexually abused boys tend to present more externalized

problems than girls (Spataro et al., 2004; Tyler, 2002), specifically conduct disorders (Daigneault, Bourgeois, et al., 2017). The contrast with previous results (Daigneault, Bourgeois, et al., 2017) might be explained by the fact that the current study studied comorbidity, meaning having at least one diagnosis in different categories, and not frequency of mental health consultations and hospitalizations, as previously done. Perhaps boys consult more frequently, for more severe behavioural manifestations, but these manifestations tend to fall in the same large diagnostic category, thus weren't indicative of greater comorbidity.

Furthermore, the current study included 13 years of data, and not only five as previously done and this might have an effect on results. The number of years following reported CSA was found to be a good predictor of class membership for the CPTSD and dissociation classes. This suggests that since these abused youth were also the ones exposed to the most cumulative maltreatment compared with other classes, we might be able to better understand the symptom profile of each youth when looking at the interpersonal trauma history.

### **Study Strengths and Limitations**

This study is unique in prospectively demonstrating the impact of substantiated CSA on mental health in childhood, adolescence and early adulthood. The added value of this study was to show the impact of CSA prospectively, using a general population cohort matched on age, gender, region and socio-economic level while controlling for mental health problems prior to CSA report substantiated to CPA, intellectual disability and social and material deprivation. Some limitations should be considered. We could only consider comorbidity for a limited amount of categories (i.e. fourteen). A category was comprised of a variety of different diagnoses, and if a participant was given different diagnoses that fell within that same category, they were considered only as one diagnostic category. Further studies could include more distinct



categories and consider the frequency of each diagnosis in analyses. Also, underrepresentation of mental health diagnoses prevalence is possible since only public medical data were used, lacking data from the private sector, as well as from psychological consultations in all types of settings (i.e. public, schools, private sector). Furthermore, in some cases, patients might not have seen a medical doctor even if presenting symptoms. Also, since only one diagnosis can be entered in the system for each visit, it's possible some disorders might have been incorrectly or partially entered. Indeed, if patients reported an array of various symptoms, doctors might have selected the best fitting diagnosis or the more prominent one. Importantly, since CSA is widely underreported (Stoltenborgh et al., 2011), it can't be assumed that all children in the general population had in fact not been sexually abused. Indeed, they might have been exposed to CSA but not reported it to authorities; they might have reported it to another CPA than the participating one if they moved to another CPA sector during the study; they also might have reported CSA to participating CPA outside of data collection years. All these limits might underestimate the prevalence of diagnoses and comorbidity and the differences between the groups and limits the generalization of results to CPA involved youth.

**Directions for future research and clinical implications**

The current study's results add to past research in showing CSA's potential impact on the psychological wellbeing of children and adolescents, as well as on public health care systems. Early psychological assessments following substantiated reports of CSA, as well as all other types of maltreatment, are warranted to provide appropriate and immediate care. Moreover, half of the children and adolescents exposed to CSA in this study presented little or no mental health diagnoses, indicating a potentially resilient functioning. These results should however not impede efforts to alternatively support and monitor youth who have been exposed to

interpersonal trauma like CSA and maltreatment. They may have been underdiagnosed or not consulted for mental health problems even if they were suffering from important symptoms or disorders. Current findings reiterate the importance of tailoring interventions to the specific needs and clinical profiles of each abused child and adolescent, namely focusing on inner strengths and interpersonal features (i.e. adaptive coping strategies, attributional style, and self-esteem) as has been stated in past research (Marriott et al., 2014). Indeed, continued monitoring could be necessary, as symptoms can sometimes be latent and present themselves in later circumstances. Results also suggest two subgroups presenting some comorbidity and one subgroup presenting very high comorbidity, highlighting how symptoms following CSA and maltreatment can greatly vary, and necessitate individualized treatment. For the youth presenting such high comorbidity, trauma-focused interventions could be warranted in order to address PTSD symptoms and behaviour problems, exhibit more positive functioning and improve strengths (Bartlett et al., 2018). Programs like trauma-focused CBT (TF-CBT; Cohen, Mannarino, Kliethermes, & Murray, 2012) and *attachment, regulation and competency* (ARC; Blaustein & Kinniburgh, 2010; Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005) are promising avenues to treat complex trauma and could be considered in the case of exposure to CSA and maltreatment. Current findings contribute to data for the inclusion of a complex PTSD diagnosis in the revised version of the fifth edition of the DSM (APA, 2013) as will be the case in the 11<sup>th</sup> ICD version.

Findings that maltreatment additional to CSA and time for which data could be obtained were predictors of class membership also have important implications. From a clinical perspective, such results indicate the possibility of cumulative maltreatment while being exposed to CSA must be considered since these youth are at higher risk of developing more complex

psychosocial disturbances profiles. Such information would be important to conduct evaluation and treatment planning, specifically on medical diagnostic training as some youth accumulating various diagnoses may benefit from a unified diagnosis of CPTSD, which is uncommonly used in Canada. Future studies could further investigate the developmental trajectories of youth presenting highly comorbid profiles and do so using National samples so that results may be generalized beyond youth under CPA care.

Table 1

*ICD-10 specific diagnostic categories included in the study*

Variables	Broader diagnostic categories (corresponding numbers)	Specific diagnostic categories (corresponding numbers)
Substance use	Mental and behavioural disorders due to psychoactive substance use (F10-F19)	Alcohol (F10), opioids (F11), cannabinoids (F12), sedatives (F13), cocaine (F14), other stimulants (F15), hallucinogens (F16), tobacco (F17), volatile solvents (F18), other (F19)
Schizophrenia	Schizophrenia, schizotypal and delusional disorders (F20-F29)	Schizophrenia (F20), schizotypal (F21), persistent delusional (F22), acute and transient psychotic (F23), induced delusional (F24), schizoaffective (F25), other (F28), unspecified (F29)
Personality	Disorders of adult personality and behaviour (F60-F69)	Specific personality (F60), mixed (F61), enduring personality changes (F62), habit and impulse (F63), gender identity (F64), sexual preference (F65), sexual development (F66), other (F68), unspecified (F69)
Development	Disorders of psychological development (F80-F89)	Development of language (F80), scholastic skills (F81), motor function (F82), mixed (F83), pervasive (F84), other (F88), unspecified (F89)
Unspecified	Unspecified mental disorder (F99)	Mental disorder, not otherwise specified (F99)
Manic/bipolar		Manic episode (F30), bipolar affective (F31)
Depression	Mood [affective] disorders (F30-F39)	Depressive episodes (F32), recurrent depression (F33), persistent mood (F34), other (F38), unspecified (F39)
Anxiety/phobias		Phobic anxiety (F40), other (F41), obsessive compulsive (F42)
PTSD	Neurotic, stress-related and somatoform disorders (F40-F49)	Reaction to severe stress and adjustment (F43)
Dissociation and somatoform		Dissociative (F44), somatoform (F45), other (F48)
Eating disorders		Eating (F50)
Physiological impact	Behavioural syndromes associated with physiological disturbances and physical factors (F50-F59)	Sleep (F51), sexual dysfunction (F52), psychological factors associated with disease (F54), abuse non-dependence substance (F55), unspecified (F59)

Hyperkinetic Conduct and social	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence (F90-F98)	Hyperkinetic disorders (F90) Conduct (F91), mixed of conduct and emotion (F92), emotional (F93), social functioning (F94), tic (F95), other (98)
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Table 2

*Mental health diagnoses prevalence of at least one diagnosis within category (ext. services and hospitalization) and prevalence of multiple diagnoses*

		%	
		Control (n = 882)	CSA (n = 882)
F10 - F19	Disorders due to psychoactive substance use	1	7
F20 - F29	Schizophrenia and delusion disorders	-	2
F60 - F69	Disorders of the adult personality and behaviour	1	6
F80 - F89	Disorders of psychological development	2	6
F99	Unspecified mental disorder	1	7
F32 - F39	Depression	2	8
F30 - F31	Bipolar and manic disorders	-	1
F40 - F42	Anxiety and phobias	6	16
F43	Reactions to severe stress and adjustment disorders	2	6
F44 - F48	Dissociation and somatoform disorders	5	13
F50	Eating disorders	-	-
F51 - F59	Behavioural syndromes associated with physiological disturbances/physical factors	2	7
F90	Kinetic disorders with onset in childhood/adolescence	4	11
F91 - F98	Conduct and social disorders with onset in childhood/adolescence	6	13
0	diagnoses	71	38
1	diagnosis	13	20
2 - 3	diagnoses	10	20
4 +	diagnoses	6	22
<b>Total (N=1764)</b>			

Table 3

*Model fit information for competing latent class models*

No classes	Likelihood ratio	AIC	BIC
2	-57,249.96	11,507.99	1,166.68
3	-55,548.56	11,197.71	1,143.86
4	-3,550.067	7,218.13	7,500.84
5	-53,459.98	10,839.99	1,124.52

Table 4

*Diagnostic category probabilities for four-class models: Probabilities of individual mental health comorbidity in latent class*

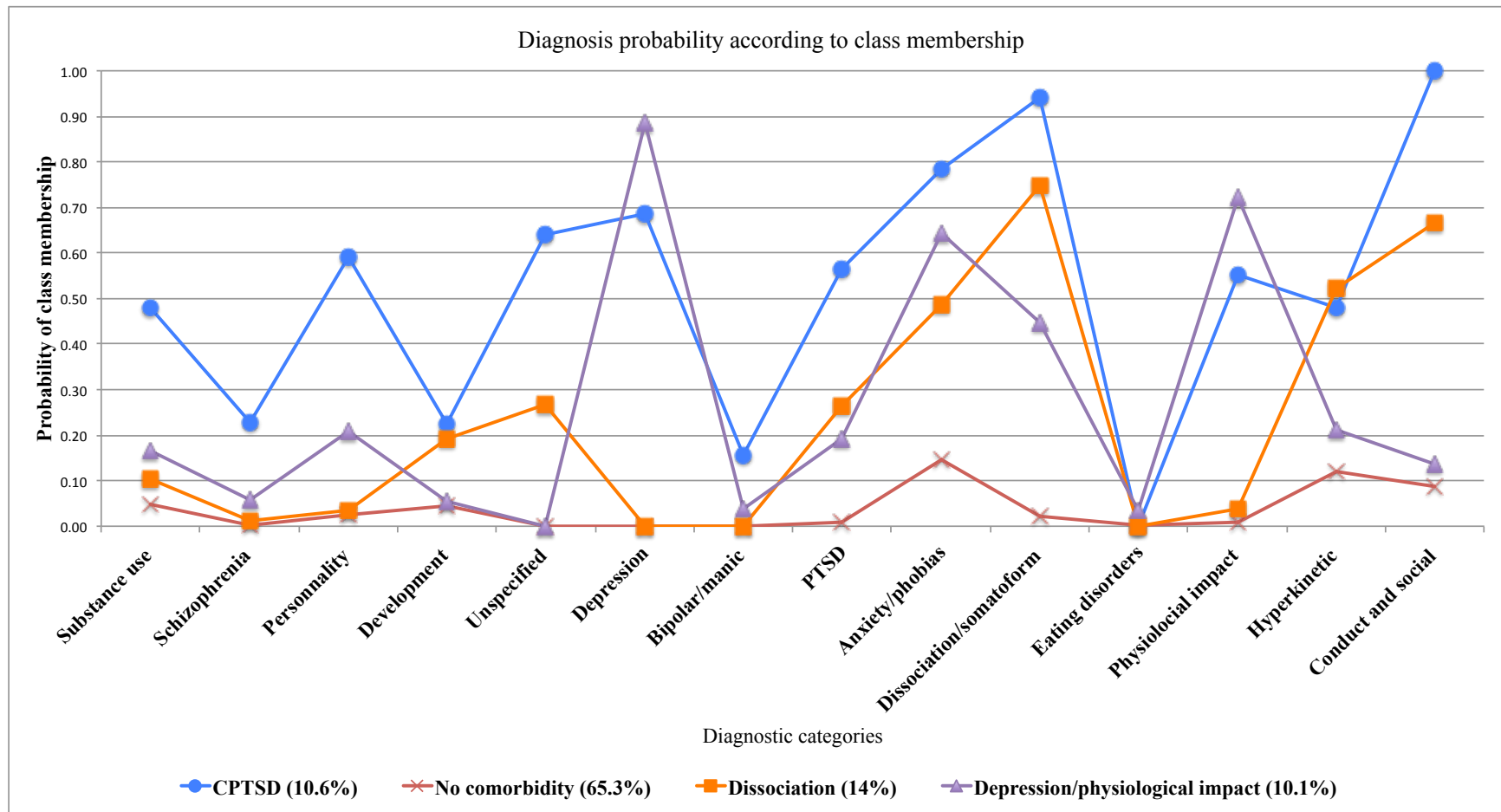
	CPTSD (10.6%)	Low comorbidity (65.3%)	Dissociation (14%)	Depression/physiological impact (10.1%)
Substance use	0.48	0.05	0.10	0.17
Schizophrenia	0.23	-	-	0.06
Personality	0.59	0.03	0.04	0.21
Development	0.22	0.04	0.19	0.05
Unspecified	0.64	-	0.27	0.00
Depression	0.69	-	-	0.89
Bipolar/manic	0.16	-	-	0.04
PTSD	0.56	-	0.26	0.19
Anxiety/phobias	0.79	0.15	0.49	0.64
Dissociation/somatoform	0.94	-	0.75	0.45
Eating disorders	-	-	-	0.03
Physiological impact	0.55	-	0.04	0.72
Hyperkinetic	0.48	0.12	0.52	0.21
Conduct and social	1.00	0.09	0.67	0.14



Table 5

*Description of gender and cumulative maltreatment additional to CSA, according to class (n = 882)*

<i>Class</i>	% Maltreatment types				% Multiple diagnoses				% Gender	
	<b>0</b>	<b>1</b>	<b>2</b>	<b>3+</b>	<b>0</b>	<b>1</b>	<b>2 or 3</b>	<b>4+</b>	Females	Males
CPTSD	23	17	18	46	-	-	-	100	73	27
No comorbidity	46	13	10	26	60	28	12	-	75	25
Dissociation	31	20	14	36	-	53	47	-	71	29
Depression	41	10	8	41	-	43	57	-	85	15



**Figure 1.** Probabilities of mental health comorbidity, by latent class. Blue line: CPTSD class (highest comorbidity class), red line: no comorbidity class, green line: dissociation class, orange line: depression/physiological impact class.

## Références

- Ackerman, P. T., Newton, J. E., McPherson, W., Jones, J. G., & Dykman, R. A. (1998). Prevalence of post traumatic stress disorder and other psychiatric diagnoses in three groups of abused children (sexual, physical, and both). *Child Abuse & Neglect, 22*(8), 759-774.
- Afifi, T. O., MacMillan, H. L., Taillieu, T., Cheung, K., Turner, S., Tonmyr, L., & Hovdestad, W. (2015). Relationship between child abuse exposure and reported contact with child protection organizations: Results from the Canadian Community Health Survey. *Child Abuse & Neglect, 46*, 198-206.
- APA. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC: American Psychiatric Association.
- Ayer, L., Danielson, C. K., Amstadter, A. B., Ruggiero, K., Saunders, B., & Kilpatrick, D. (2011). Latent classes of adolescent posttraumatic stress disorder predict functioning and disorder after 1 year. *Journal of the American Academy of Child & Adolescent Psychiatry, 50*(4), 364-375.
- Bartlett, J. D., Griffin, J. L., Spinazzola, J., Fraser, J. G., Noroña, C. R., Bodian, R., . . . Barto, B. (2018). The impact of a statewide trauma-informed care initiative in child welfare on the well-being of children and youth with complex trauma. *Children and Youth Services Review, 84*, 110-117.
- Blaustein, M. E., & Kinniburgh, K. M. (2010). *Treating traumatic stress in children and adolescents: How to foster resilience through attachment, self-regulation, and competency*. New York, NY: Guilford Press; US.

- Bourgeois, C., Lecomte, T., & Daigneault, I. (2018). Psychotic disorders in sexually abused youth: A prospective matched-cohort study. *Schizophrenia Research*.  
doi:<https://doi.org/10.1016/j.schres.2018.03.020>
- Brady, K. L., & Caraway, S. J. (2002). Home away from home: factors associated with current functioning in children living in a residential treatment setting. *Child Abuse & Neglect*, 26(11), 1149-1163.
- Brand, E. F., King, C. A., Olson, E., Ghaziuddin, N., & Naylor, M. (1996). Depressed adolescents with a history of sexual abuse: Diagnostic comorbidity and suicidality. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(1), 34-41.
- Brodbeck, J., Fassbinder, E., Schweiger, U., Fehr, A., Späth, C., & Klein, J. P. (2018). Differential associations between patterns of child maltreatment and comorbidity in adult depressed patients. *Journal of Affective Disorders*.
- Brosbe, M. S. (2014). *Beyond PTSD: Predictors of psychological comorbidities in sexually abused children*. (74), ProQuest Information & Learning, US.
- Brown, S. M., Rienks, S., McCrae, J. S., & Watamura, S. E. (2017). The co-occurrence of adverse childhood experiences among children investigated for child maltreatment: A latent class analysis. *Child Abuse & Neglect*, (In press).  
doi:<https://doi.org/10.1016/j.chiabu.2017.11.010>
- Choi, K. R., Seng, J. S., Briggs, E. C., Munro-Kramer, M. L., Graham-Bermann, S. A., Lee, R. C., & Ford, J. D. (2017). The Dissociative Subtype of Posttraumatic Stress Disorder (PTSD) Among Adolescents: Co-Occurring PTSD, Depersonalization/Derealization, and Other Dissociation Symptoms. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(12), 1062-1072.

- Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4*.
- Cloitre, M., Stolbach, B. C., Herman, J. L., van der Kolk, B., Pynoos, R., Wang, J., & Petkova, E. (2009). A developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress, 22*(5), 399-408. doi:doi:10.1002/jts.20444
- Cohen, J. A., Mannarino, A. P., Kliethermes, M., & Murray, L. A. (2012). Trauma-focused CBT for youth with complex trauma. *Child Abuse & Neglect, 36*(6), 528-541.
- Collin-Vézina, D., Coleman, K., Milne, L., Sell, J., & Daigneault, I. (2011). Trauma Experiences, Maltreatment-Related Impairments, and Resilience Among Child Welfare Youth in Residential Care. *International Journal of Mental Health and Addiction, 9*(5), 577-589. doi:10.1007/s11469-011-9323-8
- Collins, L. M., & Lanza, S. T. (2010). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences*. New York: Wiley.
- Connor, D. F., Doerfler, L. A., Toscano, P. F., Jr., Volungis, A. M., & Steingard, R. J. (2004). Characteristics of children and adolescents admitted to a residential treatment center. *Journal of Child and Family Studies, 13*(4), 497-510.
- Cook, A., Spinazzola, J., Ford, J. D., Lanktree, C., Blaustein, M., Cloitre, M., . . . van der Kolk, B. A. (2005). Complex Trauma in Children and Adolescents. *Psychiatric Annals, 35*(5), 390-398.

Cyr, K., Chamberland, C., Clément, M.-È., Lessard, G., Wemmers, J.-A., Collin-Vézina, D., . . .

Damant, D. (2013). Polyvictimization and victimization of children and youth: Results from a populational survey. *Child Abuse & Neglect, 37*(10), 814-820.

Daigneault, I., Bourgeois, C., Vézina-Gagnon, P., Alie-Poirier, A., Dargan, S., Hébert, M., & Frappier, J.-Y. (2017). Physical and Mental Health of Sexually Abused Boys: a 5 Year Matched-Control and Cohort Study. *Journal of Child & Adolescent Trauma, 10*(1), 9-17. doi:10.1007/s40653-016-0120-1

Daigneault, I., Cyr, M., & Tourigny, M. (2003). Profil psychologique d'adolescentes agressées sexuellement et prises en charge par les services de protection de la jeunesse. *Santé Mentale au Québec, 28*(2), 211-232.

Daigneault, I., Hébert, M., Bourgeois, C., Dargan, S., & Frappier, J.-Y. (2017). Santé mentale et physique des filles et garçons agressés sexuellement : une étude de cas contrôle apparié avec un suivi de cohorte sur 10 ans. *Criminologie, 50*(1).

Daigneault, I., Tourigny, M., & Cyr, M. (2004). Description of trauma and resilience in sexually abused adolescents: An integrated assessment. *Journal of Trauma Practice, 3*(2), 23-47.

Daigneault, I., Vézina-Gagnon, P., Bourgeois, C., Esposito, T., & Hébert, M. (2017). Physical and mental health of children with substantiated sexual abuse: Gender comparisons from a matched-control cohort study. *Child Abuse & Neglect, 66*, 155-165.

Euser, S., Alink, L. R. A., Tharner, A., IJzendoorn, M. H., & Bakermans - Kranenburg, M. J. (2015). The Prevalence of Child Sexual Abuse in Out - of - home Care: Increased Risk for Children with a Mild Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities, 29*(1), 83-92. doi:doi:10.1111/jar.12160

- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., . . . Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults - The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245-258. doi:10.1016/s0749-3797(98)00017-8
- Fergusson, D. M., Boden, J. M., & Horwood, L. (2008). Exposure to childhood sexual and physical abuse and adjustment in early adulthood. *Child Abuse & Neglect, 32*(6), 607-619.
- Finkelhor, D., & Hashima, P. Y. (2001). The Victimization of Children and Youth. *Handbook of Youth and Justice, 49-78*. doi:10.1007/978-1-4615-1289-9\_4
- Finkelhor, D., Ormrod, R., Turner, H., & Hamby, S. L. (2005). The Victimization of Children and Youth: A Comprehensive, National Survey. *Child Maltreatment, 10*(1), 5-25. doi:10.1177/1077559504271287
- Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2009). Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse & Neglect, 33*(7), 403-411.
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of adverse childhood experiences. *Child Abuse & Neglect, 48*, 13-21.
- Ford, J. D. (2011). Future directions in conceptualizing complex post-traumatic stress syndromes in childhood and adolescence: Toward a developmental trauma disorder diagnosis. *Ardino, Vittoria [Ed] (2011) Post-traumatic syndromes in childhood and adolescence: A handbook of research and practice (pp 433-448) xix, 466 pp Wiley-Blackwell.*
- Ford, J. D., & Courtois, C. A. (2014). Complex PTSD, affect dysregulation, and borderline personality disorder. *Borderline personality disorder and emotion dysregulation, 1*(1), 1.

- Ford, J. D., Elhai, J. D., Connor, D. F., & Frueh, B. (2010). Poly-victimization and risk of posttraumatic, depressive, and substance use disorders and involvement in delinquency in a national sample of adolescents. *Journal of Adolescent Health, 46*(6), 545-552.
- Ford, J. D., Gagnon, K., Connor, D. F., & Pearson, G. (2011). History of interpersonal violence, abuse, and nonvictimization trauma and severity of psychiatric symptoms among children in outpatient psychiatric treatment. *Journal of Interpersonal Violence, 26*(16), 3316-3337.
- Gallitto, E., Lyons, J., Weegar, K., Romano, E., & Team, M. A. P. R. (2017). Trauma-symptom profiles of adolescents in child welfare. *Child Abuse Negl, 68*, 25-35.  
doi:10.1016/j.chiabu.2017.03.011
- Gilbert, R., Widom, C. S., Browne, K., Fergusson, D. M., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet, 373*(9657), 68-81. doi:10.1016/s0140-6736(08)61706-7
- Goldman, J. D. G., & Padayachi, U. K. (2000). Some methodological problems in estimating incidence and prevalence in child sexual abuse research. *Journal of Sex Research, 37*(4), 305-314. doi:Doi 10.1080/00224490009552052
- Hébert, M., Parent, N., Daignault, I. V., & Tourigny, M. (2006). A Typological Analysis of Behavioral Profiles of Sexually Abused Children. *Child Maltreatment, 11*(3), 203-216.
- Hillberg, T., Hamilton-Giachritsis, C., & Dixon, L. (2011). Review of meta-analyses on the association between child sexual abuse and adult mental health difficulties: A systematic approach. *Trauma, Violence, & Abuse, 12*(1), 38-49.
- Hyland, P., Shevlin, M., Elklit, A., Murphy, J., Vallieres, F., Garvert, D. W., & Cloitre, M. (2016). An Assessment of the Construct Validity of the ICD-11 Proposal for Complex



- Posttraumatic Stress Disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, No Pagination Specified. doi:10.1037/tra0000114
- Hyland, P., Shevlin, M., McNally, S., Murphy, J., Hansen, M., & Elklit, A. (2016). Exploring differences between the ICD-11 and DSM-5 models of PTSD: Does it matter which model is used? *Journal of Anxiety Disorders*, *37*, 48-53.  
doi:10.1016/j.janxdis.2015.11.002
- Johnson, R. J. (2008). Advances in understanding and treating childhood sexual abuse: Implications for research and policy. *Family & Community Health*, *31*, S24-S31.
- Kaplow, J. B., Hall, E., Koenen, K. C., Dodge, K. A., & Amaya-Jackson, L. (2008). Dissociation predicts later attention problems in sexually abused children. *Child Abuse & Neglect*, *32*(2), 261-275.
- Kearney, C. A., Wechsler, A., Kaur, H., & Lemos-Miller, A. (2010). Posttraumatic stress disorder in maltreated youth: A review of contemporary research and thought. *Clinical Child and Family Psychology Review*, *13*(1), 46-76.
- Kendall-Tackett, K. A., Williams, L. M., & Finkelhor, D. (1993). Impact of sexual abuse on children: A review and synthesis of recent empirical studies. *Psychological Bulletin*, *113*(1), 164-180.
- Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., . . . Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO World Mental Health Surveys. *The British Journal of Psychiatry*, *197*(5), 378-385.
- Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and

- comorbidity: Results from the National Survey of Adolescents. *Journal of Consulting and Clinical Psychology*, 71(4), 692-700. doi:10.1037/0022-006X.71.4.692
- Kinniburgh, K. J., Blaustein, M., Spinazzola, J., & van der Kolk, B. A. (2005). Attachment, Self-Regulation, and Competency. *Psychiatric Annals*, 35(5), 424-430.
- Lau, A. S., Leeb, R. T., English, D., Graham, J. C., Briggs, E. C., Brody, K. E., & Marshall, J. M. (2005). What's in a name? A comparison of methods for classifying predominant type of maltreatment. *Child Abuse & Neglect*, 29(5), 533-551.
- Lyons, J. (2018). *Sexual Abuse Characteristics and Psychological Functioning among Male Survivors of Childhood Sexual Abuse*. Université d'Ottawa/University of Ottawa.
- Maniglio, R. (2009). The impact of child sexual abuse on health: A systematic review of reviews. *Clinical Psychology Review*, 29(7), 647-657.
- Marriott, C., Hamilton-Giachritsis, C., & Harrop, C. (2014). Factors promoting resilience following childhood sexual abuse: A structured, narrative review of the literature. *Child Abuse Review*, 23(1), 17-34.
- Martin, G., Bergen, H. A., Richardson, A. S., Roeger, L., & Allison, S. (2004). Sexual abuse and suicidality: gender differences in a large community sample of adolescents. *Child Abuse & Neglect*, 28(5), 491-503.
- Marx, B. P., & Sloan, D. M. (2003). The effects of trauma history, gender, and race on alcohol use and posttraumatic stress symptoms in a college student sample. *Addictive Behaviors*, 28(9), 1631-1647.
- Mathews, B., & Collin-Vézina, D. (2017). Child Sexual Abuse: Toward a Conceptual Model and Definition. *Trauma, Violence, & Abuse*, 1524838017738726.  
doi:10.1177/1524838017738726

- McLeer, S. V., Dixon, F. J., Henry, D., Ruggiero, K., Escovitz, K., Niedda, T., & Scholle, R. (1998). Psychopathology in non-clinically referred sexually abused children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 37(12), 1326-1333.
- Ministère de la santé et des services sociaux. (2008). *Faire un signalement au DPJ, c'est déjà protéger un enfant*. Québec, Canada.
- Ministère de la santé et des services sociaux. (2016). *Filing a report to the DYP is already protecting a child: When and how to file a report?* Québec, Canada: La Direction des communications du ministère de la Santé et des Services sociaux du Québec.
- Naar-King, S., Silvern, L., Ryan, V., & Sebring, D. (2002). Type and severity of abuse as predictors of psychiatric symptoms in adolescence. *Journal of Family Violence*, 17(2), 133-149.
- Niven, D. J., Berthiaume, L. R., Fick, G. H., & Laupland, K. B. (2012). Matched case-control studies: a review of reported statistical methodology. *Clinical Epidemiology*, 4, 99-110. doi:10.2147/CLEP.S30816
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural equation modeling*, 14(4), 535-569.
- Oquendo, M. A., Friend, J. M., Halberstam, B., Brodsky, B. S., Burke, A. K., Grunebaum, M. F., . . . Mann, J. J. (2003). Association of comorbid posttraumatic stress disorder and major depression with greater risk for suicidal behavior. *American Journal of Psychiatry*, 160(3), 580-582.
- Pampalon, R., Gamache, P., & Hamel, D. (2010). *Indice de défavorisation matérielle et sociale du Québec : suivi méthodologique de 1991 À 2006*. Gouvernement du Québec Retrieved

from

[http://www.inspq.qc.ca/pdf/publications/1176\\_IndiceDefavorisation1991A2006.pdf](http://www.inspq.qc.ca/pdf/publications/1176_IndiceDefavorisation1991A2006.pdf).

Paolucci, E. O., Genuis, M. L., & Violato, C. (2001). A Meta-Analysis of the Published Research on the Effects of Child Sexual Abuse. *The Journal of Psychology, 135*(1), 17-36.

doi:10.1080/00223980109603677

Pauze, R., Toupin, J., Déry, M., Mercier, H., Cyr, M., Cyr, F., & Frappier, J.-Y. (2000). *Les soins aux jeunes en difficulté - QC-411 - Volet 1. Portrait des jeunes inscrits à la prise en charge des centres jeunesse du Québec et description des services reçus au cours des premiers mois*. Retrieved from Montréal:

Putnam, F. W. (2003). Ten-year research update review: Child sexual abuse. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(3), 269-278.

doi:10.1097/00004583-200303000-00006

Rivera, P. M., Fincham, F. D., & Bray, B. C. (2018). Latent Classes of Maltreatment: A Systematic Review and Critique. *Child Maltreatment, 23*(1), 3-24.

doi:10.1177/1077559517728125

Rosen, G. M., & Lilienfeld, S. O. (2008). Posttraumatic stress disorder: An empirical evaluation of core assumptions. *Clinical Psychology Review, 28*(5), 837-868.

Scott-Storey, K. (2011). Cumulative Abuse: Do Things Add Up? An Evaluation of the Conceptualization, Operationalization, and Methodological Approaches in the Study of the Phenomenon of Cumulative Abuse. *Trauma, Violence, & Abuse, 12*(3), 135-150.

doi:10.1177/1524838011404253

Shin, S. H., Hong, H. G., & Hazen, A. L. (2010). Childhood sexual abuse and adolescent substance use: A latent class analysis. *Drug & Alcohol Dependence, 109*(1), 226-235.

- Silverman, A. B., Reinherz, H. Z., & Giaconia, R. M. (1996). The long-term sequelae of child and adolescent abuse: A longitudinal community study. *Child Abuse & Neglect, 20*(8), 709-723.
- Spataro, J., Mullen, P. E., Burgess, P. M., Wells, D. L., & Moss, S. A. (2004). Impact of child sexual abuse on mental health: Prospective study in males and females. *The British Journal of Psychiatry, 184*(5), 416-421. doi:10.1192/bjp.184.5.416
- Steine, I. M., Winje, D., Krystal, J. H., Bjorvatn, B., Milde, A. M., Grønli, J., . . . Pallesen, S. (2017). Cumulative childhood maltreatment and its dose-response relation with adult symptomatology: findings in a sample of adult survivors of sexual abuse. *Child Abuse & Neglect, 65*, 99-111.
- Stoltenborgh, M., van Ijzendoorn, M. H., Euser, E. M., & Bakermans-Kranenburg, M. J. (2011). A global perspective on child sexual abuse: Meta-analysis of prevalence around the world. *Child Maltreatment, 16*(2), 79-101.
- Tanaka, M., Wekerle, C., Schmuck, M. L., & Paglia-Boak, A. (2011). The linkages among childhood maltreatment, adolescent mental health, and self-compassion in child welfare adolescents. *Child Abuse and Neglect, 35*(10), 887-898.  
doi:10.1016/j.chiabu.2011.07.003
- Tourigny, M., Hébert, M., Joly, J., Cyr, M., & Baril, K. (2008). Prevalence and co-occurrence of violence against children in the Quebec population. *Australian and New Zealand Journal of Public Health, 32*(4), 331-335. doi:10.1111/j.1753-6405.2008.00250.x
- Tremblay, C., Hébert, M., & Piché, C. (2000). Type I and type II posttraumatic stress disorder in sexually abused children. *Journal of Child Sexual Abuse: Research, Treatment, & Program Innovations for Victims, Survivors, & Offenders, 9*(1), 65-90.

Turner, H. A., Finkelhor, D., & Ormrod, R. (2010). Poly-Victimization in a National Sample of Children and Youth. *American Journal of Preventive Medicine, 38*(3), 323-330.

Tyler, K. A. (2002). Social and emotional outcomes of childhood sexual abuse: A review of recent research. *Aggression and Violent Behavior, 7*(6), 567-589. doi:10.1016/S1359-1789(01)00047-7

Vachon, D. D., Krueger, R. F., Rogosch, F. A., & Cicchetti, D. (2015). Assessment of the harmful psychiatric and behavioral effects of different forms of child maltreatment. *JAMA Psychiatry, 72*(11), 1135-1142. doi:10.1001/jamapsychiatry.2015.1792

van der Kolk, B. A. (2017). Developmental Trauma Disorder: Toward a rational diagnosis for children with complex trauma histories. *Psychiatric Annals, 35*(5), 401-408.

Wekerle, C., Goldstein, A. L., Tanaka, M., & Tonmyr, L. (2017). Childhood sexual abuse, sexual motives, and adolescent sexual risk-taking among males and females receiving child welfare services. *Child Abuse & Neglect, 66*, 101-111.

World Health Organization. (2008). *The ICD-10 classification of mental and behavioral disorders: diagnostic criteria for research*. Geneva: World Health Organization.

World Health Organization (Producer). (2016). ICD-11 Beta Draft (Joint Linearization for Mortality and Morbidity Statistics). Retrieved from

<http://apps.who.int/classifications/icd11/browse/l-m/en>