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Highlights

- Non-sexual abuse types such as, emotional and physical abuses are uniquely associated with personality pathology traits.
- Based on exposure to childhood maltreatment types, three latent classes, differing in maltreatment types and severity emerge in a treatment-seeking sample of adolescents.
- Latent classes with exposure to more types of maltreatment and higher severity were higher on traits of personality pathology, personality disorder symptom counts, and diagnosed personality disorders.

ACCEPTED MANUSCRIPT

**Associations of Specific and Multiple Types of Childhood Abuse and Neglect with
Personality Pathology among Adolescents Referred for Mental Health Services**

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Abstract

The present study investigated the unique association between five types of childhood abuse and neglect and 18 lower-order dimensions of personality pathology, and using latent classes analysis (LCA) explored patterns of childhood abuse or neglect experiences. Further differences across latent classes on personality pathology traits, personality disorder symptom count and a diagnosis of personality disorder were examined. Participants were 178 adolescents and young adults (12-22 years; $M = 16.02$, 65.7% girls; 83% Axis I/II disorder) from the Netherlands referred for mental health services. Emotional abuse was uniquely associated with 11 personality pathology traits; sexual and physical were associated with three and four traits, respectively. LCA yielded three classes, namely, *severe maltreatment* (class 1), *low-moderate emotional maltreatment and sexual abuse* (class 2), and *least maltreatment* (class 3). After controlling for age, gender, presence of any Axis I disorder, multivariate analysis of covariance indicated that classes with more types of maltreatment experiences and higher severity (classes 1 and 2) endorsed more personality pathology traits, personality disorder symptom counts and a diagnosis of a personality disorder than the least maltreatment class. Findings have theoretical and clinical implications entailing the identification of patterns of maltreatment types and related personality pathology traits among youth.

Keywords: Abuse and Neglect, Adolescents, Latent Class Analysis, Personality Pathology, CTQ, DAPP-BQ-A

1. Introduction

Studies investigating the association between childhood abuse and neglect, and personality problems (e.g., Johnson et al. 2001; Lobbetael et al. 2010) often assess the latter as a diagnosis of personality disorder rather than assessing traits of personality pathology (e.g., Cohen et al., 2014). This can be problematic as studies suggest that personality traits, and not a diagnosis of personality disorder

(PD), are more consistent across adolescence to adulthood (Caspi and Roberts, 2001). Additionally, prior studies have investigated the association of only single type of abuse or neglect (e.g., sexual abuse) and personality pathology, although child maltreatment research demonstrates a high co-occurrence between various types of abuse and neglect (Higgins and McCabe, 2001). The present study addresses these gaps in the literature by examining the unique and cumulative associations of five types of childhood abuse and neglect with personality pathology, assessed through traits, PD symptom counts, and as well as PD diagnoses among adolescents and youth referred for mental health services.

1.1. Assessment of Adolescent/Youth Personality Pathology

A growing body of research supports the occurrence of personality pathology in adolescents and youth and highlights its presence across clinical and nonclinical populations (Sharp et al., 2012; Tackett, 2006). Studies examining personality pathology also acknowledge the limitation of using the categorical classification system of the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association [APA], 2013) as a diagnostic tool for personality disorders (Widiger and Samuel, 2005). Specifically, the excessive diagnostic co-occurrence among DSM-defined personality disorders (Bornstein, 1998) brings into question the validity of these diagnostic categories. Some efforts have been made to amend this, and although DSM-5 (APA, 2013) retains the categorical approach, it also introduces and calls for future research on a hybrid dimensional-categorical model that uses both, personality disorders and multi-faceted personality problem traits. In the present study, we use 18 personality pathology traits similar to those in Section III of the DSM-5 (APA, 2013), as assessed through a standardized questionnaire, next to DSM-IV defined PD symptom counts, and diagnosed personality disorders, both assessed through a structured interview.

With a focus on PD symptoms in younger populations, attention is now being directed towards assessing maladaptive personality traits during adolescence (Tackett et al., 2009). In this regard, considerable efforts have been made towards the development of age-specific personality models for children and adolescents (Tackett, 2006). Today a number of measures are available for the dimensional assessment of maladaptive personality traits among adolescents, including the Dimensional Assessment

of Personality Pathology for Adolescents (see measures section, DAPP-BQ-A; Tromp and Koot, 2008).

Assessment of personality pathology early on is essential as it aids clinical interventions directed towards alleviating problematic personality traits.

1.2. Comorbidity between Personality Disorders and Axis I Disorders

Prior studies suggest comorbidity between a diagnosis of PD and Axis I psychopathology (Crawford et al. 2008; Gunderson et al. 2014; Korsgaard et al. 2016; Strandholm et al. 2017). For example, in an adolescent outpatient sample with attention deficit hyperactivity disorder, 4.6% had comorbidity with a personality disorder (Korsgaard et al. 2017). Similarly, a study based on data from the Collaborative Longitudinal Personality Disorders Study found a reciprocal interaction between a diagnosis of borderline personality disorder with depression and bipolar disorders over the course of 10 years ranging from adolescence to adulthood (Gunderson et al. 2014). Since there is comorbidity between personality pathology and Axis I disorders, it is important to control for the effect of Axis I disorders to increase specificity in the association between risk factors (e.g., childhood maltreatment) and maladaptive personality traits or personality disorders.

1.3. Theoretical Framework Linking Childhood Maltreatment and Personality Pathology

A leading theoretical framework for understanding the central aspects of personality disorders focuses on Bowlby and Ainsworth's attachment theory (Ainsworth et al. 1978; Bowlby, 1973). Central to this theory is the concept of "internal working models" (Bowlby, 1973), that is, mental schemas of self and others that guide interactions among individuals. These working models are a result of early caregiver-child interactions that influences a child's conceptualization of availability of support (i.e., secure base) and ability to function independently cognizant of the reliability of the support. For example, a child with caregivers who are nurturing and supportive will develop mental schemas that others are reliable and supportive, while a child with neglectful or abusive caregivers may develop schemas of others as uncaring and unavailable. These mental schemas comprise components of one's personality structure that tend to remain stable over time (see Levy et al. 2015).

Related, models of developmental psychopathology indicate that personality pathology is shaped by biological (e.g., monoamine oxidase A [*MAOA*] genotype) and environmental mechanisms, such as exposure to childhood maltreatment (see Cicchetti, 2016). For example, Rogosch and Cicchetti (2005) found that in contrast to non-maltreated children those with maltreatment experiences were higher on potential precursors of borderline personality disorder, namely, emotional lability, conflictual relationships with peer and adults, relational aggression, and self-harm. Studies on gene-environment interactions suggest that the effect of childhood maltreatment on the development of personality disorders is moderated by the presence or absence of certain genes (Byrd and Manuck, 2014). For example, Caspi and colleagues (2002) found that in males' maltreated children with the genotype conferring to high *MAOA* gene activity were significantly less likely to develop antisocial personality problems in adulthood than maltreated children with low-activity *MAOA* genotype. High *MAOA* genotype metabolizes neurotransmitters, namely, dopamine, serotonin, and norepinephrine, making them inactive. In sum, studies indicate that both nature and nurture have implications on the etiology of personality pathology. In the present study, we aim to examine the role of different types of childhood maltreatment on personality pathology traits, personality disorder symptoms, and a diagnosis of PD in a referred sample of adolescents and young adults from the Netherlands.

1.4. Unique versus Cumulative Effects of Childhood Abuse and Neglect Types on Personality

Pathology

Drawing from the theories enumerated above and prior literature, exposure to childhood maltreatment, including physical, sexual, and emotional abuse, and physical and emotional neglect, is an established risk factor for personality pathology (Lobbestael et al., 2010). However, it remains unclear if there is an association between specific types of childhood maltreatment and personality pathology traits or personality disorders. Prior studies have suggested an association between childhood sexual abuse and a diagnosis of borderline PD (Biskin et al. 2011), childhood physical abuse and antisocial personality traits and PD in adulthood (Lobbestael, 2010), childhood emotional abuse and risk of Cluster C traits (Johnson et al. 2001) and narcissistic features (Afifi et al. 2011), and between childhood neglect and

Cluster A personality disorders and traits (Afifi et al. 2011; Berenbaum et al. 2003). However, some of these associations have not been replicated in other studies. For example, after controlling for the effect of other types of childhood maltreatment Afifi et al. (2011) did not find an association between emotional abuse and Cluster C personality disorders, as did Johnson et al. (2001). Notably, many of the above-mentioned studies (except Afifi et al. 2011; Johnson et al. 2001) did not control for the effect of co-occurring maltreatment types. Additionally, most of these studies (except Johnson et al., 2001) comprise adult samples. Thus, it is important to replicate these findings in an adolescent sample while controlling for the effect of co-occurring maltreatment types and Axis I disorders. Findings would inform prevention and clinical intervention directed towards personality pathology.

While the examination of the unique effect of a specific type of childhood maltreatment informs the line of inquiry examining whether different childhood maltreatment types are equally “toxic” for later outcomes, the examination of the cumulative and interactive effects of exposure to multiple types of childhood maltreatment (Charak et al. 2015, 2016; Herrenkohl and Herrenkohl, 2009) provides a holistic picture of the accumulating stress, and aids clinical decisions related to intervention and treatment (Nurius et al. 2012). In line with the latter, studies have started to employ a person-centered statistical technique, known as latent class analysis (LCA; Ballard et al. 2015; Charak et al. 2016; Pears et al. 2008) that classifies participants’ into different homogenous classes based on similar response patterns to a series of items (e.g., child/adolescent maltreatment histories), and the classes are probabilistic in nature. For example, as part of an epidemiologically based, randomized field trial of school-based preventive interventions, Ballard et al. (2015) found three latent classes based on childhood traumatic events occurring before the age of 13 years. These latent classes differed from each other in exposure to types of victimization, and were labeled as low childhood trauma, violence exposure class, and sexual assault class. In a study on undergraduate students from the United States, Berzenski and Yates (2011) reported two and four latent classes based on the total sample, a maltreated sample, and a sample with exposure to multiple types of maltreatment. In sum, prior studies suggest the presence of two to four latent classes of maltreatment, and indicate that in contrast to those individuals exposed to fewer types or less severe

levels of abuse and neglect experiences, those exposed to more maltreatment types and higher intensities of maltreatment experiences have greater risk of psychopathology. To date using LCA only one study has investigated the role of multiple types of abuse and neglect on the dimensional aspects of personality pathology (Charak and Koot, 2015). While the study found four patterns of child maltreatment types, and supported related cumulative risk for personality problems, this study however was unable to highlight the clinical levels of personality problems as it was conducted on school-going adolescents, and no assessment of personality disorders or PD symptom count as defined by the DSM taxonomy was conducted. To bridge this gap in the literature, the present study aims to examine the patterns of child maltreatment types and related personality pathology dimensions, symptom count of personality disorder, and a diagnosis of PD in a treatment-seeking sample of adolescents and young adults.

1.5. The Current Study

Based on findings from prior studies, we hypothesized that like sexual abuse, non-sexual abuse, and neglect would be significantly and uniquely associated with many dimensions of personality pathology (e.g., Cohen et al., 2014; Johnson et al., 2001). Second, it was hypothesized that latent classes of adolescents/young adults could be identified based on their experiences of childhood maltreatment types such that there would be at least one latent class with multiple types of maltreatment experiences (e.g., Pears et al. 2008). Third, it was hypothesized that adolescents and young adults exposed to a higher number of maltreatment types and higher intensities of maltreatment would endorse more types and higher levels of personality pathology traits as assessed by a self-report tool, and would more likely show elevated levels of DSM-IV defined PD symptom counts and be diagnosed with a PD, than those exposed to fewer types of maltreatment (Charak and Koot, 2015). The study was performed among a sample of adolescents and young adults referred for psychiatric services in the Netherlands.

2. Method

2.1. Participants and Procedures

Participants were 178 youth in the age range of 12-22 years ($M = 16.02$ years, $SD = 2.41$; 65.7% girls) referred for in- or outpatient mental health care provided by four participating agencies in the Netherlands. Participants were recruited after referral through written and verbal information, and with parental written informed consent for minors. These agencies serve clients from all sociodemographic strata that are referred to them through family physicians or mental health specialists. Services are paid through (obligatory) health insurance. All youths referred to participating agencies were approached for participation, except when referral was due to a crisis situation (e.g., suicide attempt). The vast majority of participants (94.4%) were born in the Netherlands, and 91.0% were living with one or both parents, while others lived with other family members or friends. All were pursuing or had completed at least four years of secondary education.

Participants completed the questionnaires individually at home or at the mental health center, within the first month of referral either in paper-and pencil format ($n = 113$) or via the internet ($n = 53$). No information was available for 12 participants on the method used for administration and on the 18 dimensions of personality pathology. Childhood maltreatment scores were available for the 178 participants and they were included in all subsequent analyses. The range of DSM-IV PD diagnoses, as assessed by the Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II; First et al., 1997), were Histrionic 0% to Borderline 15.7%. Since no one was diagnosed with Histrionic PD, this PD was dropped from any further analyses. Distribution of Axis I disorders and personality disorders are presented in Table 1. With regard to co-occurrence between PD and Axis I disorder among those with a DSM-IV diagnosis, 36% of the participants were diagnosed with both a personality disorder and an Axis I disorder, while 42.1% had only Axis I psychopathology, and 5% had a diagnosis of personality disorder only. The Dutch central committee on research involving human subjects approved the study procedures.

2.2. Measures

2.2.1. Childhood Maltreatment

Childhood maltreatment was assessed through the Childhood Trauma Questionnaire (CTQ; Bernstein et al. 1994, 1997). There are many versions of the CTQ ranging from 28 items to 70 items. Norms for the 28-item CTQ are well established and widely used (Bernstein and Fink, 1998). In the present study we used the CTQ with 34-item retrospective self-report measure that assesses history of childhood maltreatment, namely, emotional abuse (5 items), physical abuse (6 items), sexual abuse (6 items), emotional neglect (11 items), and physical neglect (6 items) on a 5-point Likert scale (1, *never* - 5, *very often*). The scale can be administered to anyone 12 years and above with the precursor statement 'When I was growing up...'. As advised by the authors of CTQ (D. P. Bernstein, personal communication February 04 2005), the scoring for CTQ-34 was converted and prorated in accordance with the CTQ-28¹. Convergent and discriminant validity against therapist maltreatment ratings are established for the CTQ. In the present study, the Cronbach's alpha for the scales ranged from .65-.90. The severity of abuse/neglect types was determined by using the classificatory system developed by the authors of the CTQ-28 with maltreatment items based on sensitivity and specificity analysis found in an adolescent psychiatric inpatients and HMO members (Bernstein and Fink, 1998). The levels of severity used for each scale of the CTQ were minimal, low, moderate, and severe.

2.2.2. Personality Pathology Dimensions

The 290-item Dimensions of Personality Pathology-Basic Questionnaire-Adolescents (DAPP-BQ-A; Tromp and Koot, 2008) was translated and adapted from its adult predecessor, the DAPP-BQ (Livesley and Jackson, 2009). These self-report items assess 18 lower-order and four-higher-order dimensions of personality pathology (listed in Tables 2, 5). Scoring options are on a Likert type scale, ranging from 1 (very unlike me or not applicable) to 5 (very like me). The lower-order dimensions each comprise 16 items that describe personal preferences and behaviors, with the exception of self-harm and suspiciousness, which contain 12 and 14 items, respectively. The internal consistency of the 18 scales in

¹ The CTQ-34 was prorated into CTQ-28 format in the following ways. (i) Emotional abuse, physical abuse, and physical neglect are each measured by four items in CTQ-34 (versus 5 items in CTQ-28). Thus, a score for one additional item was prorated for each subscale in order for it to match the scoring of the CTQ-28. (ii) Sexual abuse and emotional neglect were measured each by 5 items in the CTQ-34 that matched items on CTQ-28. Hence no prorating was required for these subscales.

the original DAPP-BQ were found to be in the range of .83-.94 and the three-week test-retest reliabilities varied from .81 to .93 (Livesley and Jackson, 2009). In a non-clinical sample of Dutch adolescents, the internal consistency ranged from .73 to .92 (Tromp and Koot, 2008). In the present study, the Cronbach's alpha for scales ranged from .67 to .97.

2.2.3. *Personality Disorders*

The Dutch version (Weertman et al. 2003) of the Structured Clinical Interview for DSM-IV for Axis II disorders (SCID-II; First et al., 1997) was carried out by two trained research psychologists blind to the adolescents DAPP-BQ-A scores, during a separate interview conducted within one month of referral, and adolescents were assigned each personality disorder out of ten of which they met the diagnostic criteria. Test-retest interrater reliabilities of the trait scores indicated fair to excellent agreement (range .41-.88; Weertman et al. 2003). In the present study we also considered the PD symptom counts by computing for each PD the total number of criteria that were met. In the present study, the Cronbach's alpha for the 10 PD scales ranged from .53 for Narcissistic to .84 for Borderline PD.

2.2.4. *Covariates*

Age and gender were self-reported. The assessment of DSM-IV Axis I disorders were carried out by two trained research psychologists who also assessed presence of personality disorders. For assessment, the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I; First et al. 1996) and parts of the Schedule for Affective Disorders and Schizophrenia for School-age Children-Present and Lifetime version (K-SADS; Kaufman et al. 1997) were used.

2.3. *Analytic Approach*

To examine the unique associations between exposure to maltreatment types and personality pathology, partial correlations between each type of maltreatment and each dimension of personality pathology were computed, after parceling out the variance in each type of maltreatment and each dimension of personality pathology due to the other four types of maltreatment in addition to age, gender, and presence of Axis I disorder.

To explore patterns of childhood maltreatment types, latent class analysis (LCA) was conducted using *Mplus* 7.11 software. LCA employs maximum likelihood estimation with robust standard errors (MLR) to classify participants into latent classes based on similar response patterns to items measuring child/adolescent maltreatment histories via the CTQ. The resultant classes are probabilistic in nature. Selection of the number of classes was based on interpretive meaningfulness and statistical relevance, such as, significant Lo-Mendell-Rubin adjusted likelihood ratio test (LMR), lower values of the Akaike information criterion (AIC), the Bayesian information criterion (BIC) and the sample size adjusted Bayesian information criterion (SSABIC), and a higher entropy value (Nylund et al. 2007). The present study considered all these statistical indices to select the optimal number of latent classes from the two to four group solutions. The obtained latent classes were exported into IBM SPSS software version 23.0 for further analyses.

After obtaining the latent classes, we investigated class-membership differences in scores on the 18 dimensions of personality pathology measured via DAPP-BQ-A using multivariate analysis of covariance (MANCOVA), and latent classes differences in personality disorder trait counts, presence of clusters A, B, and C personality disorders measured via SCID-II, after controlling age, gender, and Axis I psychopathology using separate analysis of covariance (ANCOVA). In addition, class-membership differences across ten personality disorders, any PD, any cluster A PD, any cluster B PD, any cluster C PD, and presence of any Axis I disorders based on DSM-IV classificatory system, were tested with the chi-square difference testing. Since there were multiple analyses being conducted, to control for Type I errors, we used a stringent p -value of .01 as level of significance.

3. Results

3.1. *Child Abuse and Neglect, and Personality Pathology*

Nearly 62% of the participants had experienced both an abuse and neglect type, 10.7% reported abuse only, and 12.4% reported experiencing neglect only. The partial correlations between each type of childhood maltreatment and each DAPP-BQ-A dimension before and after controlling for the other maltreatment types, age, gender, and presence of any Axis I disorder, are presented in Table 2. Results

indicated that emotional abuse was uniquely and positively associated with 11 lower order dimensions of personality pathology after controlling for the other maltreatment types, age, gender, and presence of any Axis I disorder. Physical abuse was significantly although negatively correlated with submissiveness, oppositionality, intimacy problems, and social avoidance; sexual abuse was positively correlated with stimulus seeking, conduct problems, and intimacy problems. The two subtypes of neglect did not uniquely correlate with any dimension of personality pathology. All correlations were small to medium in size.

3.2. Latent Classes of Severity of Types of Childhood Abuse and Neglect

LCA indicated a three latent-class solution as the best solution based on a number of fit indices (see Table 3) and conceptual meaningfulness of the classes. The likelihood ratio test, that is, the LMR and the BLRT favored the three-class solution. The information criteria, the AIC and SSABIC also indicated a three-class solution, although the BIC suggested a two-class solution. Since LMR, BLRT, and SSABIC supported a three-class solution and given the conceptual meaningfulness of this solution, it was preferred over the rest (Nylund et al. 2007). Moreover, the entropy was high and the average posterior probability for most likely class membership ranged from .89-.96 for the three-class solution, suggestive of excellent class determination. Notably, participants were assigned to classes to which they have the highest probability of belonging.

The percentage of adolescents who endorsed a particular level of severity within each type of abuse or neglect across the three classes from the LCA analysis is presented in Table 4. Chi-square difference tests indicated a significant difference in distribution of adolescents across the three classes. Based on the endorsed level of severity within each type of childhood abuse or neglect, Class 1 ($n = 31$) was termed *severe maltreatment*, since most adolescents in this group reported severe levels of abuse and neglect compared to those in the other two groups. Class 2 ($n = 75$) was labeled *low-moderate emotional maltreatment and sexual abuse* as most adolescents in this group reported low to moderate levels of emotional abuse, emotional neglect, and sexual abuse compared to classes 1 and 3. Class 3 ($n = 72$) was

labeled the *least maltreatment* as adolescents in this group endorsed minimal levels of maltreatment of all types.

3.3. Associations of Class Membership with Dimensions of Personality Pathology

The overall MANCOVA (with age, gender, and any Axis I disorder as covariates) testing differences between the three latent classes and the 18 lower-order dimensions of personality pathology was significant (Pillai's trace = .44; $F [36] = 2.28$; $p < .001$; $\eta^2_{\text{partial}} = .22$), as were age, gender, and presence of any Axis I disorder. Univariate testing indicated class-related differences on 13 dimensions of personality pathology (Table 5). Pair-wise comparisons ($p < .01$) are reported in Table 5, ordered along the four higher-order dimensions identified for the DAPP-BQ-A. Findings indicate that the more severe maltreatment classes, that is, severe maltreatment and low-moderate emotional maltreatment and sexual abuse had higher scores than least maltreatment on nine dimensions of personality pathology; severe maltreatment had higher scores than low-moderate emotional maltreatment and sexual abuse on cognitive dysregulation, suspiciousness, and self-harm.

3.4. Associations of Class Membership with Symptom Counts of Personality Disorders, and a Diagnosis of PD

As indicated by MANCOVA, the three classes differed in the mean symptom count of personality disorders after controlling for age, gender and Axis I psychopathology (Table 6). Further chi-square analyses indicated the three latent classes differed in the distribution of Avoidant PD, Paranoid PD, Borderline PD, presence of any one PD, cluster A PD, cluster B PD, cluster C PD, and any Axis I disorder ($p < .01$; Table 7).

4. Discussion

The present study examined the unique association between five types of childhood maltreatment, namely, physical, sexual and emotional abuse, and physical and emotional neglect and 18 dimensions of personality pathology via partial correlations after controlling for the effect of age, gender, other types of abuse/neglect, and a presence of Axis I disorder, in a treatment-seeking sample comprising predominantly of adolescents. In addition, using latent class analyses we examined patterns of child abuse and neglect

and their differential association with personality pathology traits, personality disorder symptom counts, and a diagnosis of personality disorder after controlling for covariates. Findings supported hypothesis 1, in that like sexual abuse, non-sexual abuse type of maltreatment, such as emotional abuse was uniquely associated with a large number of personality pathology dimensions. In line with the second hypothesis, the present study found three different latent classes of abuse and neglect types. Supporting our third hypothesis, the latent classes with adolescents and youth endorsing more types of maltreatment at higher levels of severity (i.e., moderate and severe) reported greater personality problems on several personality traits, had higher average counts of personality disorder symptoms, and more often met criteria for different types of personality disorders.

Examination of the unique association of each type of maltreatment with dimensions of personality pathology suggested that emotional abuse was positively associated with most personality pathology dimensions subsumed under emotion dysregulation; physical abuse was negatively associated with the dimensions representing Cluster C traits, such as, submissiveness, oppositionality, and social avoidance (Cohen et al. 2014). Traits subsumed under Cluster C personality disorders are associated with anxiety, inhibition, and low social affiliation, which is in contrast to the externalizing problems, such as, reactive aggression found in physically abused children (Shackman and Pollak, 2014). Notably, in the present study physical abuse was not related to conduct problems as found in previous literature (Cohen et al. 2014; Lobbestael et al. 2010), before and after controlling for covariates. Replication of these findings by future studies is warranted.

Sexual abuse was positively associated with conduct problems and intimacy problems representing Cluster B traits. These findings are in line with prior studies that suggest a correlation between sexual abuse and Cluster B borderline PD, after controlling for the effect of other types of maltreatment (Lobbestael et al., 2010). Notably, neglect types were not uniquely associated with any maladaptive personality trait after controlling for age, gender, other types of childhood maltreatment, and co-occurring Axis I disorders (see Table 2). The present findings corroborate results from a previous study in adults that did not find associations between physical neglect and personality disorders

(Lobbestael et al. 2010). Although the unique associations of neglect types with personality pathology dimensions were not significant, it is noteworthy that in combination with other types of abuse, latent classes 1 and 2 with exposure to neglect reported higher levels of personality pathology, PD symptom counts, and more number of PD diagnoses as discussed below. The current findings fill a gap in the literature by providing information on unique effect of types of childhood abuse/neglect on personality pathology, which is in line with prior studies investigating the role of specific abuse types on development of personality problems (Norman et al. 2012). Overall, the present findings suggest that non-sexual types of maltreatment such as emotional and physical abuse are risk factors for personality pathology traits (Johnson et al. 2001; Lobbestael et al. 2010), and hence clinicians should inquire about both types, as non-sexual abuse types also have clinical implications.

Based on severity of exposure within the five types of abuse and neglect, the present study found three latent classes, which were similar to those latent classes of maltreatment found in foster care children (Pears et al., 2008), and among school-going adolescents (Charak and Koot, 2015). However, unlike the two prior studies, the present study findings did not suggest a class with experiences of neglect exclusively. Perhaps the non-existence of a class of adolescents with only neglect experiences can be attributed to the nature of the sample of adolescents largely diagnosed with a mental disorder (i.e., 84% in the present study) as prior studies indicate that psychopathology is more florid when children/adolescents report experiences of both childhood abuse and neglect (Pears et al. 2008). The present sample referred for psychiatric treatment was mostly characterized by accumulated experiences of child abuse and neglect rather than experiences of neglect only (61.2% vs. 12.4%). Current findings of the presence of three latent classes thus support prior research indicating that multiple types of maltreatment experiences, including different types of abuse and neglect experiences often co-occur (Herrenkohl and Herrenkohl, 2009).

Latent classes of adolescents exposed to more types of abuse/neglect and higher levels of severity (i.e., severe maltreatment and low-moderate emotional maltreatment and sexual abuse) scored higher on many maladaptive dimensions of personality traits, endorsed higher numbers of PD symptoms, and were more often diagnosed with PD compared to those who were least maltreated. Except for two

dimensions—cognitive dysregulation and self-harm—no differences were found on the other dimensions of personality pathology between the severe maltreatment, and low-moderate emotional maltreatment and sexual abuse classes. Specifically, only on cognitive dysregulation and self-harm we found a linear increase in risk corresponding to increase in the severity of exposure to maltreatment from least maltreatment, to low-moderate emotional maltreatment and sexual abuse, to severe maltreatment class (Table 5). Similarly, an increase in risk across these classes was found on borderline personality traits, and on number of traits representing Clusters A and B personality disorders (Table 6). Our findings suggest that exposure to more types of maltreatment do indeed lead to more maladaptive personality traits and the presence of DSM-IV personality disorder traits; however, this trend is not seen across all personality traits. Furthermore, the severe maltreatment class was more likely to have avoidant, paranoid, and borderline personality disorders, and also was more likely to have at least one type of PD, compared to the other less severe classes (Table 7). These findings support the cumulative effect of exposure to different maltreatment types (Higgins and McCabe, 2001) and also that moderate to severe levels of abuse or neglect within each type have a differential impact on personality pathology, including maladaptive traits and personality disorders. Future studies should investigate possible distal or proximal protective factors (e.g., positive cognitive appraisal, quality of network support) or risk factors (e.g., non-supportive response to disclosure, self-blame; Jonzon and Lindblad, 2004) operating between the classes making some members resilient and others vulnerable to certain personality pathology traits.

4.1. Limitations

Findings presented here should be considered in the context of study limitations. First, childhood maltreatment was inquired through a self-report questionnaire that may introduce the possibility of response bias resulting from the inability of an individual to recall victimization arising from concerns of stigma and victimization (Widom and Morris, 1997). However, it should be noted that the questionnaires used in the present study, namely the CTQ and DAPP-SF-A, have behavior specific questions that tend to reduce response bias. Second, the size of Class 1 was relatively small ($n = 31$), and although this was not unexpected as Class 1 was the class representing those with most severe exposure, the small sample size

may have undermined its differential effect across dimensions of personality pathology. Third, the present study focused on a treatment-seeking sample of youth, and while this sample gave us the opportunity to highlight the association between child maltreatment patterns and personality pathology, findings cannot be generalized to other samples. Further studies should aim at replication of present findings in community samples of adolescents. Fourth, the internal consistency of the Narcissistic PD was low as there was only one participant with the diagnosis. Fifth, we did not assess specific abuse-characteristics, such as number of perpetrators, age of onset, or duration of maltreatment (Charak et al. 2017) responsible for varying severity levels. Future studies may use these abuse-characteristics to capture severity levels of maltreatment.

5. Implications

First, by parsing out the effect of presence of any Axis I disorders, current findings provide the unique association between childhood maltreatment types, their patterns, and personality pathology. Findings add to the literature by providing evidence for the unique association between child maltreatment and personality pathology controlling for the spurious effect of Axis I disorders in a predominantly adolescent sample referred for treatment. Second, the present findings highlight the detrimental effect of non-sexual abuse, namely, emotional abuse on personality pathology, and calls for more research work in this understudied area. Further, screening for mental health and services should be directed towards youth with experiences of emotional maltreatment and neglect, since past studies indicate that children in foster care who experienced any type of non-sexual abuse were less likely to receive mental health services than those with sexual abuse experiences (Leslie et al. 2004). Third, the investigation of personality pathology traits and PD, as has been done in this study, facilitates a better understanding of which pathological traits (e.g., cognitive dysregulation, self-harm) are affected by maltreatment experiences thus pointing to specific interventions. Our findings also emphasize that victims exposed to relatively lower to moderate levels of maltreatment (i.e., low-moderate emotional maltreatment and sexual abuse) should be catered as at-risk adolescents as they endorsed more maladaptive personality traits than the least exposed, albeit to a lesser extent than the class with the most

severe maltreatment (severe maltreatment class). Preventative and tailor-made clinical interventions should be formulated for adolescents with similar maltreatment experiences. Fourth, youth rarely self-refer for treatment as a result of which they are dependent on adult gatekeepers of mental health services. Caregivers play an important role in this process, and hence promotion of mental health education for caregivers, may prove helpful for utilization of mental services for youths and for those with maltreatment experiences in particular (Gudino et al. 2012).

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Table 1

Percentage diagnosed with DSM-IV Axes I- and II disorders

Axis I Disorders*	(n/%)	Axis II Disorders*	(n/%)
Mood disorder	85/47.8	Depressive PD	34/19.1
Anxiety disorder	72/40.4	Borderline PD	28/15.7
Eating disorder	28/15.9	Avoidant PD	25/14.0
Psychotic disorder	28/15.7	Antisocial PD	27/15.2
Substance use disorder	17/9.6	Paranoid PD	18/10.1
Somatoform disorder	10/5.6	Obsessive-Compulsive PD	13/7.3
Adjustment disorder	2/1.1	Passive-Aggressive PD	12/6.7
[†] Posttraumatic stress disorder	27/15.2	Dependent PD	7/3.9
Any Axis I disorder	139/78.1	Schizoid PD	5/2.8
		Schizotypal PD	1/0.6
		Narcissistic PD	1/0.6
		Cluster A PD	21/11.8
		Cluster B PD	48/27.0
		Cluster C PD	35/19.7
		Any Axis II disorder	73/41.0

Note. *Multiple diagnoses can be present. [†]PTSD is subsumed under Anxiety disorders.

Table 2

Partial Correlations Between Types of Childhood Maltreatment and the 18 Lower-order Dimensions of DAPP-BQ-A

<i>Dimensions of personality pathology</i>	<i>EA</i>	<i>EA*</i>	<i>PA</i>	<i>PA*</i>	<i>SA</i>	<i>SA*</i>	<i>EN</i>	<i>EN*</i>	<i>PN</i>	<i>PN*</i>
<i>Emotional Dysregulation</i>										
Submissiveness	.23 (.003))	.26 (.001))	-.23 (.004))	-.24 (.002))	.11 (.18)	.13 (.11)	.02 (.81))	-.02 (.80))	.004 (.96)	- (.003) (.97))
Cognitive dysregulation	.29 (.001))	.33 (.001))	-.05 (.53)	-.05 (.53)	.03 (.70)	.06 (.44)	.07 (.38))	.07 (.38))	.08 (.33)	.07 (.41))
Identity problems	.29 (.001))	.33 (.001))	-.16 (.05)	-.18 (.02)	.04 (.63)	.08 (.32)	.04 (.62))	.04 (.62))	.07 (.39)	.05 (.52))
Affect lability	.34 (.001))	.37 (.001))	-.12 (.13)	-.14 (.07)	.15 (.07)	.18 (.03)	-.09 (.24))	-.09 (.28))	.07 (.39)	.05 (.52))
Oppositionality	.32 (.001))	.34 (.001))	-.24 (.003))	-.25 (.002))	.04 (.58)	.06 (.44)	-.02 (.82))	-.02 (.83))	.03 (.72)	.02 (.78))
Anxiousness	.29 (.001))	.33 (.001))	-.18 (.02)	-.20 (.012))	.12 (.13)	.16 (.05)	-.09 (.28))	-.08 (.33))	.06 (.49)	.04 (.62))
Social avoidance	.29 (.001))	.32 (.001))	-.27 (.001))	-.28 (.001))	.12 (.13)	.14 (.08)	.02 (.84))	.02 (.83))	.01 (.88)	.01 (.94))
Suspiciousness	.34 (.001))	.37 (.001))	-.02 (.83)	-.04 (.64)	.13 (.11)	.15 (.06)	-.09 (.26))	-.09 (.28))	-.03 (.68)	-.04 (.61))
Insecure attachments	.22 (.005))	.26 (.001))	-.05 (.50)	-.07 (.37)	.11 (.19)	.13 (.10)	-.14 (.07))	-.14 (.08))	-.01 (.90)	-.02 (.83))
Narcissism	.24 (.003))	.25 (.001))	-.16 (.052))	-.16 (.041))	-.02 (.84)	-.006 (.94)	-.07 (.36))	-.07 (.37))	.02 (.79)	.02 (.82))

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Self-harm	.18 (.02)	.23 (.004)	.08 (.32)	.05 (.55)	.10 (.19)	.14 (.09)	.03 (.69)	.03 (.69)	.16 (.04)	.14 (.07)
<i>Dissocial Behavior</i>										
Stimulus seeking	.15 (.07)	.15 (.06)	.06 (.46)	.06 (.48)	.20 (.01)	.20 (.01)	-.06 (.45)	-.06 (.45)	.01 (.89)	.01 (.89)
Callousness	.17 (.04)	.18 (.02)	.10 (.22)	.09 (.28)	-.08 (.33)	-.06 (.43)	.04 (.63)	.04 (.62)	-.08 (.35)	-.08 (.32)
Rejecting behavior	.18 (.02)	.17 (.03)	.03 (.75)	.03 (.70)	.01 (.89)	.004 (.96)	-.09 (.25)	-.09 (.25)	-.08 (.29)	-.08 (.30)
Conduct problems	.17 (.03)	.20 (.011)	.04 (.65)	.02 (.79)	.19 (.02)	.21 (.007)	-.05 (.55)	-.05 (.56)	.00 (.998)	- (.006)
<i>Inhibitedness</i>										
Restricted expression	.18 (.03)	.18 (.02)	-.05 (.54)	-.05 (.54)	-.01 (.90)	-.01 (.89)	.05 (.55)	.05 (.55)	.04 (.64)	.04 (.64)
Intimacy problems	.18 (.02)	.21 (.01)	-.24 (.003)	-.25 (.002)	.27 (.001)	.28 (.001)	.03 (.72)	.03 (.71)	-.02 (.80)	-.02 (.76)
<i>Compulsivity</i>	.02 (.79)	.03 (.68)	.08 (.33)	.07 (.37)	-.09 (.24)	-.09 (.27)	-.04 (.63)	-.04 (.63)	.02 (.78)	.02 (.80)

Note. EA = Emotional Abuse; PA = Physical Abuse; SA = Sexual Abuse; EN = Emotional Neglect; PN = Physical Neglect. *Analyses controlled for age, gender, presence of other four types of childhood maltreatment, and any Axis I disorder. In parentheses are p values. A significance level of $p < .01$ was used.

Table 3

Fit Indices for the Latent Class Models With Two to Four Classes for Severity Within the Type of Abuse and Neglect in Dutch Referred Adolescents

Number of classes	LMR (<i>p</i> value)	BLRT (<i>p</i> value)	Entropy	AIC	BIC	Adjusted BIC
2	222.94 (.001)	-998.23 (.001)	.86	1,832.84	1,931.48	1,833.30
3	64.60 (.02)	-885.42 (.001)	.83	1,799.46	1,949.01	1,800.16
4	27.86 (1.00)	-852.73 (.22)	.83	1,803.27	2,003.72	1,804.21

Note. LMR = Lo-Mendell-Rubin test. BLRT = Bootstrap Likelihood Ratio Test. AIC = Akaike's Information Criterion. BIC = Bayesian Information Criterion.

Table 4

Percentage Distribution and Chi-square Test Differences Across the Three Latent Classes of Maltreatment Severity

<i>Levels of severity of abuse and neglect</i>	<i>Total</i> (<i>n</i> = 178)	<i>Class 1</i> (<i>n</i> / <i>%</i>)	<i>Class 2</i> (<i>n</i> / <i>%</i>)	<i>Class 3</i> (<i>n</i> / <i>%</i>)	<i>Chi-square</i>
<i>Emotional abuse ($\alpha = .85$)</i>					
Minimal	33.7	0/0	3/3.7	54/75.4	169.79***
Low	30.3	1/3.4	37/49.1	17/23.2	
Moderate	18.5	8/26.1	25/33.5	1/1.4	
Severe	17.4	22/70.5	10/13.8	0/0	
<i>Physical abuse ($\alpha = .90$)</i>					
Minimal	78.7	6/19.7	63/83.5	70/97.2	98.07***
Low	6.7	4/12.8	6/8.4	2/2.8	
Moderate	3.9	4/11.3	4/5.0	0/0	
Severe	10.7	17/56.2	2/3.0	0/0	
<i>Sexual abuse ($\alpha = .88$)</i>					
Minimal	55.6	4/10.3	33/43.9	61/84.6	84.33***
Low	16.3	5/16.4	19/26.1	5/7.0	
Moderate	14.0	5/17.2	18/24.1	2/3.3	
Severe	14.0	17/56.1	5/6.0	4/5.2	
<i>Emotional neglect ($\alpha = .84$)</i>					
Minimal	29.8	2/4.7	4/5.2	45/62.9	150.09***
Low	36.5	0/0	43/57.0	23/31.5	
Moderate	15.7	6/18.0	21/28.2	2/3.0	
Severe	18.0	23/77.4	7/9.6	2/2.6	
<i>Physical neglect ($\alpha = .65$)</i>					
Minimal	62.4	1/3.2	43/57.3	65/90.0	83.35***
Low	21.3	13/41.9	22/28.8	5/7.1	
Moderate	10.7	9/29.0	8/11.0	2/2.8	
Severe	5.6	8/25.8	2/2.8	0/0	

Note. Class 1 = Severe maltreatment (*n* = 31); Class 2 = Low-moderate emotional maltreatment and sexual abuse (*n* = 75); Class 3 = Least maltreatment (*n* = 72). ****p* < .001

Table 5

Univariate Analysis and Estimated Means Scores of the Three Latent Classes on the 18 Lower-order Dimensions of DAPP-BQ-A, and Pairwise Comparisons Controlling for Age, Gender, and Axis I Psychopathology

<i>Dimensions of personality pathology (DAPP-BQ-A)</i>	<i>Class 1</i>	<i>Class 2</i>	<i>Class 3</i>	<i>F-ratio</i>	<i>Pairwise comparison of the classes</i>
	<i>Mean (S.E.)</i>				
<i>Emotional Dysregulation</i>					
Submissiveness	44.26 (2.34)	41.89 (1.42)	38.94 (1.47)	2.04 ^{ns}	---
Cognitive dysregulation	49.47 (2.22)	42.67 (1.34)	34.20 (1.40)	18.58***	1 > 2 > 3
Identity problems	52.0 (1.72)	48.32 (1.04)	42.16 (1.08)	13.89***	1, 2 > 3
Affect lability	54.84 (2.15)	51.02 (1.30)	44.0 (1.35)	11.27***	1, 2 > 3
Oppositionality	48.95 (2.25)	47.24 (1.36)	41.68 (1.42)	5.31**	1, 2 > 3
Anxiousness	55.51 (2.60)	50.67 (1.57)	46.95 (1.63)	3.91*	1 > 3
Social avoidance	51.10 (2.60)	45.41 (1.57)	41.07 (1.63)	5.35**	1 > 3
Suspiciousness	44.34 (1.97)	37.11 (1.19)	33.27 (1.24)	10.92***	1 > 2, 3
Insecure attachment	46.88 (2.75)	45.10 (1.66)	41.45 (1.73)	1.76 ^{ns}	---
Narcissism	42.96 (2.34)	44.39 (1.42)	39.82 (1.47)	2.48 ^{ns}	---
Self-harm	43.64 (2.65)	30.22 (1.60)	22.19 (1.67)	22.84***	1 > 2 > 3
<i>Dissocial Behavior</i>					
Stimulus seeking	50.17 (2.39)	48.53 (1.44)	41.25 (1.50)	7.69***	1, 2 > 3

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Callousness	35.82 (2.03)	35.89 (1.23)	29.68 (1.28)	6.70**	2 > 3
Rejecting behavior	42.52 (2.28)	44.85 (1.38)	40.54 (1.43)	2.33 ^{ns}	---
Conduct problems	37.11 (2.36)	34.23 (1.43)	26.48 (1.48)	9.87***	1, 2 > 3
<i>Inhibitedness</i>					
Restricted expression	52.17 (1.60)	47.11 (.97)	43.38 (1.0)	7.91***	1, 2 > 3
Intimacy problems	43.06 (1.60)	43.45 (.97)	38.87 (1.0)	5.71**	2 > 3
Compulsivity	44.62 (2.15)	44.08 (1.3)	43.66 (1.35)	0.07 ^{ns}	---

Note. DAPP-BQ-A = Dimensional Assessment of Personality Pathology-Basic Questionnaire for Adolescents. Twelve participants had missing values on the DAPP-BQ-A leaving an effective sample of $N = 166$ in the above analyses. Class 1 = Severe maltreatment ($n = 27$); Class 2 = Low-moderate emotional maltreatment and sexual abuse ($n = 71$); Class 3 = Least maltreatment ($n = 68$). Pairwise comparisons of classes were based on post-hoc testing at $p < .01$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Univariate Analysis and Estimated Mean Counts of DSM-IV Personality Disorder Traits Across the Three Latent Classes of Adolescents, and Pairwise Comparisons Controlling for Age, Gender, and Axis I Psychopathology

Personality Disorder Symptom Count	Class 1	Class 2	Class 3	F Ratio	Pairwise comparison of the classes
	Mean (S.E.)				
Avoidant	2.20 (.30)	1.46 (.19)	1.03 (.20)	5.17**	1 > 3
Dependent	1.45 (.25)	.71 (.16)	.68 (.17)	3.58*	1 > 3
Obsessive-compulsive	1.74 (.24)	1.17 (.15)	.77 (.16)	5.55**	1 > 3
Paranoid	2.21 (.27)	1.18 (.17)	.65 (.18)	10.96***	1 > 2, 3
Schizotypal	1.79 (.18)	.81 (.11)	.47 (.12)	19.06***	1 > 2, 3
Schizoid	1.06 (.17)	.59 (.11)	.29 (.11)	6.78***	1 > 3
Narcissistic	.81 (.15)	.37 (.09)	.22 (.10)	5.37**	1 > 2, 3
Borderline	3.45 (.38)	2.34 (.24)	.81 (.25)	19.05***	1 > 2 > 3
Antisocial	4.28 (.65)	2.70 (.41)	1.23 (.42)	7.84**	1, 2 > 3
Cluster A	5.06 (.47)	2.58 (.30)	1.41 (.31)	20.01***	1 > 2 > 3
Cluster B	6.51 (.69)	4.01 (.43)	1.69 (.45)	17.43***	1 > 2 > 3
Cluster C	5.38 (.62)	3.34 (.39)	2.48 (.41)	7.33***	1 > 2, 3

Note. Class 1 = Severe maltreatment ($n = 31$; 17.4%); Class 2 = Low-moderate emotional maltreatment and sexual abuse ($n = 75$; 42.1%); Class 3 = Least maltreatment ($n = 72$; 40.5%). Pair-wise comparisons of classes were based on post-hoc testing at $p < .01$ level. * $p < .05$, ** $p < .01$. *** $p < .001$.

Table 7

Distribution of Diagnosed DSM-IV Personality Disorders across Between the Three Latent Classes of Maltreatment

<i>Personality Disorder</i>	<i>Class 1 (n/%)</i>	<i>Class 2 (n/%)</i>	<i>Class 3 (n/%)</i>	<i>Chi-square tests (p value)</i>
Avoidant PD	9/29	13/17.3	3/4.2	12.23 (.002)
Dependent PD	3/9.7	2/2.7	2/2.8	3.28 (.19)
Obsessive- compulsive PD	5/16.1	6/8	2/2.8	5.80 (.06)
Paranoid PD	8/25.8	9/12	1/1.4	14.72 (.001)
Schizotypal PD	1/3.2	0/0	0/0	4.77 (.09)
Schizoid PD	3/9.7	2/2.7	0/0	7.44 (.02)
Narcissistic PD	1/3.2	0/0	0/0	4.77 (.09)
Borderline PD	10/32.3	16/21.3	2/2.8	17.28 (.001)
Antisocial PD	8/25.8	13/17.3	6/8.3	5.61 (.06)
Any PD	22/71.0	38/50.7	13/18.1	30.07 (.001)
Any Cluster A PD	10/32.3	10/13.3	1/1.4	20.14 (.001)
Any Cluster B PD	16/51.6	24/32	8/11.1	19.72 (.001)
Any Cluster C PD	11/35.5	19/25.3	5/6.9	13.81 (.001)
Any Axis I disorder	30/96.8	62/82.0	47/65.3	14.15 (.001)

Note. PD = Personality disorder as measured by Structured Clinical Interview for DSM-IV Personality Disorders. Histrionic PD was not diagnosed in this sample. Class 1 = Severe maltreatment ($n = 31$; 17.4%); Class 2 = Low-moderate emotional maltreatment and sexual abuse ($n = 71$; 42.1%); Class 3 = Least maltreatment ($n = 68$; 40.5%). Correction term is $p < .01$.

ACCEPTED MANUSCRIPT