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Are there differential relationships between different types of childhood maltreatment and different types of adult personality pathology?

Lisa Janet Cohen^{a,*}, Thachell Tanis^a, Reetuparna Bhattacharjee^a, Christina Nesci^b, Winter Halmi^a, Igor Galynker^a

^a Beth Israel Medical Center, Department of Psychiatry and Behavioral Sciences, Beth Israel Medical Center, 1st Avenue & 16th Street, New York, NY 10003, USA

^b Department of Psychology, George Washington University, Washington, D.C., USA

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ABSTRACT

While considerable data support the relationship between childhood trauma and adult personality pathology in general, there is little research investigating the specific relationships between different types of childhood maltreatment and adult personality disorders. The present study tested a model incorporating five a priori hypotheses regarding the association between distinct forms of childhood maltreatment and personality pathology in 231 psychiatric patients using multiple self-report measures (Personality Diagnostic Questionnaire-4th Edition, Child Trauma Questionnaire, Conflict in Tactics Scale Parent-Child Child-Adult, and Multidimensional Neglectful Behavior Scale). Step-wise linear regressions supported three out of five hypotheses, suggesting independent relationships between: physical abuse and antisocial personality disorder traits; emotional abuse and Cluster C personality disorder traits; and maternal neglect and Cluster A personality disorder traits after controlling for co-occurring maltreatment types and personality disorder traits. Results did not support an independent relationship between sexual abuse and borderline personality traits nor between emotional abuse and narcissistic personality disorder traits. Additionally, there were three unexpected findings: physical abuse was independently and positively associated with narcissistic and paranoid traits and negatively associated with Cluster C traits. These findings can help refine our understanding of adult personality pathology and support the future development of clinical tools for survivors of childhood maltreatment.

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1. Introduction

Over the past several decades diverse strains of thought (e.g., attachment theory, cognitive therapy, and relational psychoanalysis) have converged into what might be called the schema theory of personality (Beck and Freeman, 1990; Cloninger et al., 1993; Mitchell, 1988). In this model, a child's experience in early relationships is encoded into personalized representations of self and other, which in turn influence cognition, affect and behavior. These interpersonal representations, or schemas, provide the foundation of both personality and personality pathology. Drawing from this model, we can hypothesize that different forms of personality pathology arise from specific and distinct interpersonal experiences.

Childhood maltreatment, including emotional, physical, sexual abuse and neglect, represents a potent environmental risk factor for personality pathology. A significant amount of research links childhood maltreatment to adverse outcomes in adulthood,

including personality pathology (Collishaw et al., 2007; Lobbetael et al., 2010). However, it remains unclear whether specific types of childhood maltreatment predict to specific types of personality pathology. This is significant because the different forms of childhood maltreatment are behaviorally distinct and do not always co-occur, although they frequently do. Likewise there is evidence that different types of maltreatment have distinct psychopathological effects (Lobbetael et al., 2010). The present study aims to refine our understanding of the risk factors for adult personality pathology by investigating the relationship between four types of childhood maltreatment (sexual abuse, emotional abuse, physical abuse, and neglect) and distinct personality disorders (PDs). We believe this a critically important, and to date relatively neglected area of research. Potentially, such knowledge can enhance both prevention and treatment, supporting more targeted interventions with maltreated children as well as personality-disordered adults.

1.1. Maltreatment and psychopathology

Both retrospective and prospective studies show higher rates of psychopathology among adults who have undergone repeated and

* Corresponding author. Tel.: +1 212 420 2316; fax: +1 212 844 7659.
E-mail address: LCohen@chpnet.org (L.J. Cohen).

severe childhood abuse (Collishaw et al., 2007; Johnson et al., 2000). More specifically, research has shown personality disorders to be more prevalent among adults who have experienced childhood maltreatment than among those who have not (Lobbestael et al., 2010). This association appears to generalize across multiple types of childhood maltreatment and diverse forms of personality pathology (Tyrka et al., 2009). Furthermore, different forms of childhood maltreatment may have differential effects on personality pathology. In a recent study by Lobbestael et al. (2010), sexual abuse was associated with paranoid, schizoid, borderline, and avoidant traits; physical abuse with antisocial traits; emotional abuse with paranoid, schizotypal, borderline, and Cluster C traits; and emotional neglect with histrionic and borderline traits.

Hence, the literature indicates a strong association between childhood maltreatment and adult personality pathology. However, as noted by Lobbestael et al. (2010), only a few studies have delineated specific relationships between different types of maltreatment and different types of personality pathology, and at present there is no consensus in the literature on the specificity of these possible relationships.

In this vein, we propose a five-part model regarding the associations between specific types of childhood maltreatment and specific types of adult personality pathology. This model, drawn from a combination of available research data, clinical experience, and theoretical conceptualization, provides a comprehensive scheme of specific relationships between the best recognized forms of childhood maltreatment and all but one DSM IV personality disorders. The present paper tests this model with five a priori hypotheses.

1.2. A priori hypotheses

Hypothesis 1. *A history of sexual abuse will be associated with borderline personality disorder (BPD) traits independent of co-occurring maltreatment types and other PD traits.*

Our rationale for Hypothesis 1 rests on the long history of research on the association between sexual abuse and BPD (Laporte et al., 2011; Wingenfeld et al., 2011). BPD has even been conceptualized as a form of complex post-traumatic stress disorder, largely attributable to childhood sexual abuse (Lewis and Grenyer, 2009). For example, Biskin et al. (2011) evaluated a clinical sample of 47 women, 31 with a past diagnosis of BPD and 16 who did not meet BPD criteria. A history of sexual abuse was reported more frequently by subjects with current than remitted BPD and both BPD groups had higher rates than subjects without history of BPD. Additionally, Ogata et al. (1990) found that more BPD than depressed inpatients reported a history of childhood sexual abuse. Nonetheless, many of these studies fail to control for other types of maltreatment or other PDs (e.g., Ogata et al., 1990; Biskin et al., 2011). Thus our first hypothesis will test for a specific relationship between sexual abuse and BPD traits.

Hypothesis 2. *A history of physical abuse will be associated with antisocial personality disorder (ASPD) traits, independent of co-occurring maltreatment types and other PD traits.*

Because physical abuse models the reliance upon violent domination as an interpersonal strategy, we hypothesized physical abuse to be a risk factor for ASPD traits in adulthood. The literature supports such a relationship (Luntz and Widom, 1994; Evren et al., 2006). Lobbestael et al. (2010) found ASPD to be the only correlate of physical abuse in a multivariate study of childhood maltreatment and PDs. Luntz and Widom (1994) found that physically abused and neglected subjects were significantly more likely than the comparison group to meet criteria for ASPD. Likewise, Evren

et al. (2006) found high rates of childhood physical abuse and other types of maltreatment in patients with ASPD. On the other hand, other investigators have failed to replicate these findings (Tyrka et al., 2009; Grilo and Masheb, 2002). Thus our 2nd hypothesis will test for a specific relationship between physical abuse and ASPD traits.

Hypothesis 3. *A history of emotional abuse will be associated with Cluster C personality disorder traits, independent of co-occurring maltreatment types and other PD traits.*

Because emotional abuse entails derogation, humiliation and rejection of the child (Hart and Brassard, 1987) and Cluster C traits incorporate low self-esteem and social anxiety (American Psychiatric Association [APA], 2000), we hypothesized emotional abuse in childhood to be a risk factor for Cluster C traits in adulthood. While derogation and humiliation may occur in the context of other types of abuse (e.g., sexual or physical abuse), we hypothesize that emotional abuse will have a stronger relationship with Cluster C traits as this type of maltreatment is specifically intended to derogate and diminish the victim. Recent literature suggests there may indeed be such an association. Grilo and Masheb (2002) found emotional abuse to correlate with avoidant PD and Cluster C PDs overall after controlling for co-varying types of maltreatment. Additionally, in a large, community-based longitudinal study, verbal abuse was associated with obsessive-compulsive PD after controlling for co-occurring types of maltreatment (Johnson et al., 2001). Nonetheless, in a separate, large, population-based study, emotional abuse was not significantly correlated with dependent, avoidant, obsessive-compulsive, or Cluster C PDs after controlling for other forms of childhood maltreatment (Affi et al., 2011). Hence our third hypothesis will test the specific relationship between emotional abuse and Cluster C disorder traits. We chose to investigate Cluster C traits instead of the individual disorders of this cluster, i.e., avoidant, dependent and obsessive-compulsive PDs, as the literature shows a relationship between emotional abuse and more than one Cluster C disorder as well as with Cluster C traits overall (Grilo and Masheb, 2002; Johnson et al., 2001). Additionally, we presuppose social anxiety and inhibition to be a common correlate of all disorders in this “anxious” cluster (APA, 2000, 2013).

Hypothesis 4. *A history of emotional abuse will be associated with narcissistic personality disorder traits (NPD), independent of co-occurring maltreatment types and other PD traits.*

As NPD is also characterized by perturbations of self-esteem (Myers and Zeigler-Hill, 2012), we hypothesized emotional abuse to predict to NPD as well. A limited amount of literature specifically evaluates emotional abuse and NPD. Nonetheless, in a study by Hoglund (1997), emotional abuse was found to influence three covert narcissistic features: hypersensitivity, hidden grandiosity and inadequacy. Johnson et al. (2001) found after controlling for multiple covariates, that adolescents who experienced childhood verbal abuse had increased NPD traits. Additionally, Affi et al. (2011) found emotional abuse to significantly correlate with NPD. However, when evaluating the unique effects of each type of childhood maltreatment on each personality disorder, Lobbestael et al. (2010) found emotional abuse did not significantly associate with NPD.

Hypothesis 5. *A history of neglect will be associated with Cluster A personality disorder traits, independent of co-occurring maltreatment types and other PD traits.*

Cluster A PDs are characterized by impaired interest in and capacity for close relationships (APA, 2000). Therefore we hypothesized childhood neglect to be a risk factor for such

pathology, as it implies lack of close relationships with primary attachment figures. There is some support for this hypothesis. Childhood neglect has been associated with paranoid, schizoid and schizotypal disorders and traits (Afifi et al., 2011; Berenbaum et al., 2003). In a large, community-based longitudinal study (Johnson et al., 2000), childhood emotional, physical, and supervision neglect were each associated with Cluster A PDs. Additionally, Berenbaum et al. (2003) found neglect but not physical or sexual abuse to be associated with schizotypal PD. However, not all studies have replicated these findings (Grilo and Masheb, 2002; Lobbetael et al., 2010). As in Hypothesis 3, we chose to investigate the personality disorder traits at the cluster level rather than at the level of individual diagnoses as the literature showed associations between neglect and each Cluster A PD (i.e., paranoid, schizoid and schizotypal). Further, we presumed impaired interest and capacity for close relationships to cut across Cluster A disorders.

Thus there is support in the literature for each of the five a priori hypotheses listed above. Nonetheless, the literature is not wholly consistent and there are contradictory findings. For example, Tyrka et al. (2009) found no difference in the number of Clusters A, B, and C personality disorder symptoms when comparing non-clinical subjects with a history of sexual/physical abuse vs. those reporting a history of emotional abuse or neglect, although both groups scored higher than subjects with no maltreatment history. Finally, not all studies controlled for co-occurring maltreatment variables or comorbid personality disorder traits.

The present study attempts to help clarify the literature on the risk factors for personality pathology in adulthood by investigating differential relationships between four forms of childhood maltreatment and specific forms of personality pathology, after controlling for co-occurring maltreatment types and comorbid personality disorder traits. It is hoped such information can support the development of more targeted methods of assessment, prevention and intervention both with identified child victims and adults suffering from personality pathology.

2. Methods

2.1. Participants

Participants ($n=231$) were recruited from three inpatient units and the outpatient service in the psychiatry department of a large, urban hospital. All subjects signed an IRB-approved consent form before entering the study. Of the three inpatient units, two treat a general adult population while the third treats a dual diagnosis population. The outpatient clinic treats a wide variety of psychiatric diagnoses. The relative heterogeneity in clinical samples offers the potential advantage of greater generalizability of our results.

2.1.1. Inclusion/exclusion criteria

Study participants met the following inclusion criteria: aged 18–65 years, English speaking, and able to understand and willing to sign a consent form. We excluded patients with a primary psychotic diagnosis, dementia, a recent manic episode (in the past 5 years), or cognitive impairment sufficient to interfere with understanding of questionnaires.

2.2. Materials

There are numerous challenges inherent in the measurement of childhood maltreatment. Most research is based on self-report data, which suffers from multiple limitations in construct validity. These include inaccuracies of memory, conscious or unconscious report biases, and lack of standard definitions of sexual, physical, emotional abuse and neglect. To optimize construct validity, we administered three different instruments to measure childhood maltreatment and then used statistical analysis to select the most sensitive measure. The use of multiple instruments poses additional challenges, however, such as the potential for an overly complicated design and enhanced risk of Type 1 error due to an increased number of analyses. Therefore we employed a data reduction technique. We chose to select the most sensitive measure rather than to combine the measures into a composite score. We did this because we found in an earlier study that different measures vary in their predictive validity with regard to the outcome variable

(Cohen et al., 2013). Likewise combining the more sensitive measure with the less sensitive measures reduced the overall strength of the findings. We then elected to identify the optimal measure through assessment of scale inter-correlations in order to select our variables prior to performing the actual analyses (see below).

Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 1994). The CTQ is a 28 item, self-report questionnaire used to assess five areas of childhood maltreatment: sexual, physical and emotional abuse plus physical and emotional neglect. This measure has proven reliable and valid, with evidence of convergent and discriminant validity with structured trauma interviews; stability over time; and concordance with independent data (Bernstein et al., 1994). Each item is rated on a five-point Likert-type scale from “never true” to “very often true”. The sexual, physical, and emotional abuse and the physical neglect scales were used in this study.

Conflict Tactics Scale Parent Child-Child Adult (CTS-CA) (Straus et al., 1998). The CTS-CA is a 27-item, self-report questionnaire designed to assess childhood physical assault, psychological aggression, and neglect by parents in addition to non-violent modes of discipline. Participants are asked to reference their parents'/ caregivers' disciplinary style at age 13, and then to rate each item separately for mother and father on an eight point scale of frequency from “this has never happened” to “more than 20 times for a given year”. Reliability and discriminant validity for the CTS-CA were demonstrated in a sample of 1000 children (Straus et al., 1998). The physical assault, psychological aggression and neglect scales for both mother and father were used in this study.

Multidimensional Neglect Behavioral Scale (MNBS) (Straus, 2006). This 40-item, self-report questionnaire was used to assess neglect by a parent(s) or primary caregiver(s). This scale measures four types of neglect: physical, emotional, supervisory and cognitive neglect. Participants are asked to use as a reference an age when caregivers' neglectful behavior was the most salient. Subjects rate each statement on an eight point scale of frequency from “this has never happened” to “more than 20 times for a given year.” The MNBS yields four subscale scores and a total score. High levels of internal consistency and construct validity have been previously reported (Straus, 2006).

Personality Diagnostic Questionnaire (PDQ-4+) (Hyler et al., 1990) is a 99-item, True/False questionnaire designed to assess for the ten DSM-IV-TR personality disorders, in addition to two provisional PDs. The PDQ-4+ yields a total score as well as subscales for each PD. Participants indicate whether, over the past several years, each item is “generally true” or “generally false”. The PDQ-4+, a widely used personality scale, has proven reliable and valid in many past studies, especially when used as a dimensional measure (Bagby and Farvolden, 2004; Bagby et al., 2005; Widiger and Coker, 2002). The following scales were used for analysis: borderline, antisocial, narcissistic, Cluster A (paranoid, schizoid, and schizotypal) and Cluster C (obsessive-compulsive, dependent and avoidant plus the two provisional diagnoses of negativistic and depressive).

2.2.1. Demographic and clinical information

Additional demographic and clinical information was also recorded via a demographic data sheet designed for the present study and through patient charts. Clinical information, specifically medication regimen and discharge diagnosis, was obtained from patient charts. Discharge diagnoses were determined by longitudinal assessment by the treatment team, which includes observation of the patient over days or weeks, repeated interviews of the patient, and collateral interviews with family, caregivers and/or friends.

2.3. Statistical analysis

We first analyzed demographic and clinical variables to characterize the sample.

Next, in order to select the best scale to measure each maltreatment type, we performed analyses of inter-item consistency using Cronbach's alpha tests on all scales assessing the same maltreatment type. For each maltreatment type, the scale with the highest item-total correlation was selected. As we only had one scale to measure sexual abuse, these analyses were not conducted on measures of sexual abuse.

Bivariate Pearson correlations were then conducted to evaluate the association between the maltreatment subtypes and PDs of Hypotheses 1–5. This was done to provide initial analyses of these relationships prior to accounting for covariates. An alpha level of 0.05 was used for all statistical tests.

In order to test Hypotheses 1–5, five separate stepwise linear regressions were performed. In each analysis, the hypothesized personality disorder was entered as the dependent variable, the maltreatment variable of interest as the independent variable, and the other maltreatment variables plus a total score of all other PD traits entered as covariates. The maltreatment covariates were entered into the regression in the first step, the other PDs score in the second step and the maltreatment variable of interest in the third step. For example, for Hypothesis 1, Borderline Personality Disorder was entered as the dependent variable, sexual abuse as the independent variable and all other maltreatment variables plus a total score of all other (non-borderline) PD traits entered as covariates. The maltreatment covariates were entered into the regression in the first step, the PD covariates in the second step and sexual abuse in the third step.

It is important to note that even though this statistical design was selected to test our five a priori hypotheses, this method also tests for independent associations between all maltreatment and personality variables, as every maltreatment variable is entered into the final model for each personality variable. Thus our results will allow us to identify unexpected associations between variables in addition to our predicted ones. Presuming our hypotheses are supported by the data, the relative absence of unexpected findings will add greater support to the specificity of our findings.

3. Results

3.1. Demographics and clinical characteristics

Demographic and clinical data are presented in Table 1. Ninety (39%) of the subjects were recruited from the general adult inpatient unit, 40 (17.3%) from the dual diagnosis unit, 93 (40.2%) from the geriatric/adult unit, and eight (3.4%) from the outpatient service. Of the 219 subjects for whom we had medication data, 57.5% were prescribed antidepressants at time of testing, 25.1% anxiolytics, 21% mood stabilizers, and 31.5% neuroleptics. With regard to primary diagnosis at discharge, the most common diagnosis was depression (53.7%) followed by a substance abuse disorder (21%). Three subjects were diagnosed with a primary psychotic disorder at discharge, suggesting their diagnosis had changed during the inpatient stay, as primary psychotic disorder was an exclusion criterion for the study. Discharge diagnoses were not available for 17 subjects.

3.2. Analyses of inter-item consistency

To identify the most sensitive measure of emotional abuse, the CTQ Emotional Abuse scale and the CTSPC-CA psychological assault scales for mother and father were entered into an analysis

Table 1
Demographic and clinical characteristics.

	Mean	Standard deviation
Age	39.32	12.75
	Frequency	Percent
Gender		
Male	105	45.5
Female	126	54.5
Ethnicity		
White/Caucasian	113	49.3
Black/African American	34	14.8
Hispanic/Latino	64	27.9
Asian	10	4.4
Multiracial	7	3.1
Other	1	0.4
Education level		
Junior high	2	0.9
Some high school	37	16.3
High school	38	16.7
Some college	61	26.9
College degree	63	27.8
Post-graduate degree	26	11.5
Employment status		
Employed	154	70.6
Primary axis I diagnosis at discharge		
Anxiety	17	7.9
Depression	115	53.7
Bipolar disorder	34	15.9
Substance use disorder	45	21
Psychotic disorder	3	1.4

of inter-item consistency using Cronbach's alpha. The CTQ Emotional Abuse scale had the highest item-total correlation at 0.57 while the CTSPC-CA mother and father scales both had item-total correlations of 0.41.

For physical abuse, the CTQ Physical Abuse scale and the CTSPC-CA Physical Assault scales for both mother and father were entered into Cronbach's alpha analysis. The CTQ Physical Abuse had the highest item-total correlation at 0.64, with the CTSPC-CA mother and father scales at 0.36 and 0.38, respectively.

For neglect, the MNBS, CTQ Physical and Emotional Neglect scales and CTSPC-CA Neglect scale for mother and father were entered into Cronbach's alpha analysis. The CTSPC-CA Maternal Neglect scale had the highest item-total score at 0.68, with the other scales ranging from 0.61 to 0.67. Consequently, the CTSPC-CA Maternal Neglect scale and the CTQ Sexual, Physical and Emotional Abuse scales were selected for further analysis.

3.3. Descriptive statistics for maltreatment and PD variables

Descriptive statistics for all maltreatment and personality scores administered are presented in Table 2. With regard to the scales selected for further analysis, the mean scores for the CTQ Sexual, Physical and Emotional Abuse scales all fell in the moderate to severe range (9.06 ± 6.39 ; 9.85 ± 5.52 ; and 12.63 ± 6.07 , respectively). Approximately 40% (39.6%) of the subjects reported some maltreatment (low to moderate range and above) on the sexual abuse scale, 52.8% on the physical abuse scale, and 67.1% on the emotional abuse scale. The mean score for the CTSPC-CA Maternal Neglect scale was 16.63 ± 23.8 . Although CTSPC-CA norms are not currently available, scores are intended to reflect yearly frequency of the specific maltreatment type. As such, our results suggest that neglectful behaviors by subjects' mothers averaged about 16 times per year (Straus et al., 1998).

Over half of subjects (56.3%) scored above the cut-off for borderline, 25.5% for antisocial, and 25.5% for narcissistic PD. Seventy-four percent (73.6%) scored above the cut-off for at least one Cluster A disorder and 82.7% for at least one Cluster C disorder. When the two provisional diagnoses are included with Cluster C disorders, 90% exceed threshold for at least one disorder.

3.4. Simple correlations

Simple Pearson correlations between the four maltreatment measures and five targeted PD traits are presented in Table 3. Each maltreatment type was significantly correlated with at least two types of personality pathology, although the strength of the correlations ranged from small ($r=0.15$) to moderate ($r=0.35$). CTQ Sexual Abuse was modestly correlated with borderline and Cluster A traits. Both CTQ Physical and Emotional Abuse were correlated with all five PD variables. CTSPC-CA Neglect (Mother) was correlated with all PD variables except antisocial.

3.5. A priori hypotheses

Results from the a priori stepwise linear regressions are presented in Table 4. Hypothesis 1 states that sexual abuse will be associated with borderline PD traits, after controlling for the other three maltreatment variables and PD traits (see Table 4). The three maltreatment covariates, neglect, emotional and physical abuse, were entered into the regression in Model 1. This model was statistically significant, accounting for approximately 13% of the variance, and suggesting that, as a whole, this group of maltreatment variables is associated with borderline personality disorder traits. When other (non-borderline) PD traits were added to the model, the model significantly improved, now accounting for 51% of the variance ($R^2 \text{ change}=0.379$, $p < 0.001$). However,

Table 2
Maltreatment and personality disorder scores.

Maltreatment variables					
Maltreatment measure	Mean \pm S.D.	Score interpretation ^a	Maltreatment measure	Mean \pm S.D.	Score interpretation
CTQ Emotional Abuse	12.65 \pm 6.1	Moderate–severe	CTSPC Mat. Psychol Agg	33.08 \pm 33.4	33 Times per year
CTQ Physical Abuse	9.87 \pm 5.5	Moderate–severe	CTSPC Mat. Physical Ass	35.54 \pm 55.4	36 Times per year
CTQ Sexual Abuse	9.08 \pm 6.4	Moderate–severe	CTSPC Mat. Neglect	16.70 \pm 23.8	17 Times per year
CTQ Emotional Neglect	12.84 \pm 5.6	Low–moderate	CTSPC Pat. Psychol Agg ^b	27.81 \pm 30.7	28 Times per year
CTQ Physical Neglect	8.76 \pm 4.1	Low–moderate	CTSPC Pat. Physical Ass ^b	36.68 \pm 68.1	37 Times per year
MNBS Total Score	38.92 \pm 31.9	91st percentile	CTSPC Pat. Neglect ^b	18.59 \pm 23.3	19 Times per year

Personality Diagnostic Questionnaire (PDQ-4+)					
Personality disorder	N (%) above threshold	Traits, mean \pm S.D.	Personality disorder	N (%) above threshold	Traits, mean \pm S.D.
Cluster A ^c	170 (73.6%)	10.55 \pm 4.4	Histrionic	43 (18.6%)	2.96 \pm 1.8
Schizoid	91 (39.4%)	2.97 \pm 1.9	Cluster C ^c 3 dx's	191 (82.7%)	10.40 \pm 4.5
Schizotypal	85 (36.8%)	3.80 \pm 2.0	Cluster C ^{c,d} 5 dx's	208 (90%)	18.32 \pm 6.8
Paranoid	134 (58.0%)	3.78 \pm 1.8	Avoidant	128 (55.4%)	3.74 \pm 2.1
Cluster B ^c	163 (70.6%)	13.46 \pm 5.7	OCPD	151 (65.4%)	4.05 \pm 1.6
Borderline	130 (56.3%)	4.84 \pm 2.2	Dependent	44 (19%)	2.60 \pm 2.1
Narcissistic	59 (25.5%)	3.24 \pm 1.9	Negativistic	81 (36.4%)	2.97 \pm 1.8
Antisocial	59 (25.5%)	2.41 \pm 1.8	Depressive	154 (66.7%)	4.93 \pm 1.6

CTQ=Child Trauma Questionnaire, MNBS=Multidimensional Behavioral Neglect Scale, CTSPC=Conflict in Tactics Scale: Parent–Child Version, Psychol Agg=Psychological Aggression, Physical Ass=Physical Assault, Mat.=Maternal, and Pat.=Paternal.

^a Information to interpret the clinical significance of scale means as provided by scale developers is presented for each maltreatment scale. The CTQ classifies scale means into levels of severity. The MNBS provides norms based on a sample of 359 university undergraduates. The CTSPC does not provide normative data but scale means are intended to reflect yearly frequency of each maltreatment type.

^b N=191 for CTSPC Paternal variables.

^c Meets criteria for at least one disorder in that cluster.

^d Cluster C 5 dx's=3 Cluster C diagnoses plus 2 provisional diagnoses.

Table 3
Correlations between personality disorder traits and maltreatment types.

Personality traits	Sexual abuse	Physical abuse	Emotional abuse	Neglect
Borderline	0.188**	0.307***	0.345***	0.195**
Antisocial	0.107	0.315***	0.270***	0.087
Cluster C	0.053	0.153*	0.298***	0.153*
Narcissistic	0.056	0.270***	0.239***	0.175**
Cluster A	0.196**	0.336***	0.331***	0.271***

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

when sexual abuse was added to the analysis, the model did not significantly improve; the R^2 change was nonsignificant ($p=0.156$). In this final model, only other PD traits was a significant individual predictor ($Beta=0.671$, $p < 0.001$). Thus the data failed to support Hypothesis 1.

Hypothesis 2 stated that physical abuse will be associated with ASPD traits, after controlling for other maltreatment variables and PD traits (see Table 4). The maltreatment covariates of neglect, emotional abuse and sexual abuse were entered into Model 1. This model was statistically significant, accounting for 7% of the variance. When other (non-ASPD) PD traits were added, the model significantly improved (R^2 change=0.192, $p < 0.001$), accounting for 27% of the variance. When physical abuse was added, the predictive value of the model significantly improved again, now accounting for 29% of the variance (R^2 change=0.024, $p=0.007$). In the final model, physical abuse was the only maltreatment variable associated with antisocial traits, ($Beta=0.214$, $p=0.007$). Thus the data provided support for Hypothesis 2.

Hypothesis 3 stated that emotional abuse would be associated with Cluster C PD traits, after controlling for other maltreatment variables and PD traits (see Table 4). The maltreatment covariates, sexual abuse, neglect, and physical abuse, were entered into Model 1.

The model as a whole was significant, accounting for approximately 4% of the variance. When other (non-Cluster C) PD traits were added, the model significantly improved, accounting for 55% of the variance (R^2 change=0.512, $p < 0.001$). When emotional abuse was added, the model significantly improved again, now accounting for approximately 57% of the variance (R^2 change=0.023, $p=0.001$). In the final model, emotional abuse was a significant individual predictor ($Beta=0.220$, $p=0.001$). Thus the data provided support for Hypothesis 3. Of note, physical abuse was also a significant predictor but in the opposite direction ($Beta=-0.267$, $p < 0.001$).

Hypothesis 4 predicted that emotional abuse would be associated with Narcissistic PD traits, after controlling for the other maltreatment variables and PD traits (see Table 4). The maltreatment covariates, sexual abuse, neglect, and physical abuse, were entered into Model 1. This model was statistically significant, accounting for approximately 9% of the variance. When other (non-narcissistic) PD traits were added, the model significantly improved, now accounting for 34% of the variance (R^2 change=0.253, $p < 0.001$). When emotional abuse was added, the model did not significantly improve (R^2 change=0.002, $p=0.449$). In the final model, emotional abuse was not a significant predictor and physical abuse was the only maltreatment type associated with NPD traits ($Beta=0.158$, $p=0.036$). In sum, the data did not support Hypothesis 4.

Hypothesis 5 stated that neglect will be associated with Cluster A PD traits, after controlling for the other maltreatment variables and PD traits (see Table 4). The covariates, sexual, physical and emotional abuse, were entered into the first model. This model was statistically significant, accounting for approximately 13% of the variance. When other (non-Cluster A) personality disorder traits were added, the model significantly improved, now accounting for 40% of the variance (R^2 change=0.264, $p < 0.001$). The addition of neglect also significantly improved the model (R^2 change=0.011, $p=0.043$). In the final model, both neglect

Table 4

Regression analyses testing the five a priori hypotheses.

Model	R square/Beta	R square change/Beta signif.	Sig. F change
Regression analysis of Hypothesis 1 : Does childhood sexual abuse specifically predict to borderline traits?			
	R square	R square change	
Model 1	0.131	0.131	< 0.001
Model 2	0.510	0.379	< 0.001
Model 3	0.514	0.004	0.156
Model 3	Beta	Significance	
Neglect (Mother)	–0.012	0.814	
Emotional abuse	0.043	0.532	
Physical abuse	0.044	0.493	
Other personality disorder traits	0.671	< 0.001	
Sexual abuse	0.075	0.156	
Regression analysis of Hypothesis 2 : Does childhood physical abuse specifically predict to antisocial traits?			
	R square	R square change	
Model 1	0.073	0.073	0.001
Model 2	0.266	0.192	< 0.001
Model 3	0.289	0.024	0.007
Model 3	Beta	Significance	
Neglect (Mother)	–0.082	0.192	
Emotional abuse	–0.007	0.930	
Sexual abuse	–0.011	0.858	
Other personality disorder traits	0.463	< 0.001	
Physical abuse	0.214	0.007	
Regression analysis of Hypothesis 3 : Does childhood emotional abuse specifically predict to Cluster C traits?			
	R square	R square change	
Model 1	0.036	0.036	0.038
Model 2	0.548	0.512	< 0.001
Model 3	0.571	0.023	0.001
Model 3	Beta	Significance	
Neglect (Mother)	–0.035	0.469	
Sexual abuse	–0.054	0.282	
Physical abuse	–0.267	< 0.001	
Other personality disorder traits	0.764	< 0.001	
Emotional abuse	0.220	0.001	
Regression analysis of Hypothesis 4 : Does childhood emotional abuse specifically predict to narcissistic traits?			
	R square	R square change	
Model 1	0.087	0.087	< 0.001
Model 2	0.340	0.253	< 0.001
Model 3	0.342	0.002	0.449
Model 3	Beta	Significance	
Neglect (Mother)	0.045	0.451	
Sexual abuse	–0.068	0.272	
Physical abuse	0.158	0.036	
Other personality disorder traits	0.543	< 0.001	
Emotional abuse	–0.061	0.449	
Regression analysis of Hypothesis 5 : Does neglect specifically predict to Cluster A traits?			
	R square	R square change	
Model 1	0.133	0.133	< 0.001
Model 2	0.396	0.264	< 0.001
Model 3	0.407	0.011	0.043
Model 3	Beta	Significance	
Sexual abuse	0.069	0.241	
Physical abuse	0.145	0.043	
Emotional abuse	–0.033	0.667	
Other personality disorder traits	0.544	< 0.001	
Neglect (Mother)	0.116	0.043	

Hypothesis 1: Model 1 regressed Neglect (Mother), emotional abuse, and physical abuse against borderline personality disorder traits. Model 2 adds other personality disorder traits to Model 1. Model 3 adds sexual abuse to Model 2. **Hypothesis 2**: Model 1 regressed Neglect (Mother), emotional abuse, and sexual abuse against antisocial personality disorder traits. Model 2 added other personality disorder traits to Model 1. Model 3 added physical abuse to Model 2. **Hypothesis 3**: Model 1 regressed Neglect (Mother), sexual abuse, and physical abuse against Cluster C personality disorder traits. Model 2 added other personality disorder traits to Model 1. Model 3 added emotional abuse to Model 2. **Hypothesis 4**: Model 1 regressed Neglect (Mother), sexual abuse, and physical abuse against narcissistic personality disorder traits. Model 2 added other personality disorder traits to Model 1. Model 3 added emotional abuse to Model 2. **Hypothesis 5**: Model 1 regressed sexual abuse, physical abuse and emotional abuse against Cluster A personality disorder traits. Model 2 added other personality disorder traits to Model 1. Model 3 added Neglect (Mother) to Model 2.

($Beta=0.116$, $p=0.034$) and physical abuse ($Beta=0.145$, $p=0.043$) significantly predicted to Cluster A PD traits.

To summarize, the data provided support for [Hypotheses 2, 3 and 5](#) but not for [1 and 4](#).

3.6. Neglect subtypes

To gain a more fine grained understanding of the relationship between childhood neglect and Cluster A pathology in adulthood, [Hypothesis 5](#) was repeated using each of the neglect subtypes from the MNBS. Thus four regression analyses were performed, one each for MNBS emotional, physical, supervisory, and cognitive neglect. The results showed significant independent effects for supervisory and physical neglect ($Beta=0.212$ and 0.148 , respectively) on Cluster A traits and marginally significant effects for emotional neglect ($Beta=0.109$, $p=0.099$). Cognitive neglect was not significantly associated with Cluster A traits in the multivariate analysis ($Beta=0.092$, $p=0.133$).

3.7. Analysis of individual disorders in Clusters A and C

Finally, it is of interest to consider whether the positive findings for [Hypotheses 3 and 5](#) hold up when analyzing the individual Clusters A and C disorders as opposed to cluster total scores. However, when we repeated the analyses for [Hypotheses 3 and 5](#) using individual disorders from each cluster rather than cluster total scores, none of the predicted findings retained significance (data not shown). This suggests that the psychometric properties of the cluster scores benefitted from having more items than the individual PD scales. It also supports the construct validity of the cluster scores. There was, however, a significant relationship between paranoid PD and physical abuse, which may account for the unexpected association between physical abuse and Cluster A traits (see [Table 4](#)).

3.8. Collinearity

Because the different forms of childhood maltreatment tend to co-occur, collinearity is a worthwhile consideration. More specifically, strong inter-correlations among the treatment types may mask the hypothesized relationships between specific forms of maltreatment and personality traits. To address collinearity, we examined the correlations among the four different maltreatment measures used in our primary analyses (see [Supplementary Table 1](#)). All inter-correlations were statistically significant ($r=0.281$ – 0.678), with by far the highest correlation between physical abuse and emotional abuse ($r=0.678$). To test whether collinearity between physical and emotional abuse may have masked positive findings in [Hypotheses 1 and 4](#), the two hypotheses that were not supported by the data, we repeated the regression analyses for these hypotheses excluding first physical abuse and then emotional abuse. There was no change in the results for [Hypothesis 1](#), that sexual abuse would have an independent relationship with Borderline PD. Because the predictor variable for [Hypothesis 4](#) was emotional abuse, we only repeated the analysis with physical abuse excluded. Again there was no change in the outcome (data not shown). Additionally, the tolerance statistics for the primary regression analyses dropped no lower than 0.458, supporting the absence of substantial multicollinearity ([Brosius, 2008](#)). Thus it appears that collinearity among maltreatment types did not significantly alter our results.

4. Discussion

4.1. A priori hypotheses

The present study tested a model comprised of five a priori hypotheses involving independent relationships between distinct forms of childhood maltreatment and personality pathology. The results provide support for three out of five hypotheses, suggesting relationships between (1) physical abuse and antisocial traits; (2) emotional abuse and Cluster C traits and (3) maternal neglect and Cluster A traits, independent of the effects of co-occurring types of childhood maltreatment and comorbid PD traits. In the first two cases the specified forms of maltreatment were the only maltreatment types positively associated with the targeted personality traits. The data did not support the hypothesized relationships between sexual abuse and borderline traits nor emotional abuse and narcissistic traits. Thus the data provided partial but meaningful support for the proposed model.

All three of our positive results are consistent with prior findings. Antisocial PD has been previously linked with physical abuse ([Evren et al., 2006](#); [Luntz and Widom, 1994](#)). In fact, similar to the findings of [Lobbestael et al. \(2010\)](#), our study showed physical abuse to be the only significant predictor of ASPD traits, suggesting a preferential relationship. Likewise, Cluster C disorders have also been previously linked to emotional abuse ([Johnson et al., 2001](#); [Grilo and Masheb, 2002](#); [Lobbestael et al., 2010](#)). Our study also showed emotional abuse to be the only maltreatment type to positively associate with Cluster C personality traits after controlling for other forms of maltreatment and PD traits, again suggesting a preferential relationship. Our findings for the relationship between neglect and Cluster A, although neither as robust nor specific as the other two findings, are also consistent with prior literature ([Afifi et al., 2011](#); [Berenbaum et al., 2003](#); [Johnson et al., 2000](#)). That three out of four results remained significant or marginally significant when the analysis for [Hypothesis 5](#) was repeated using neglect subtypes further supports our findings.

It is of interest to consider the phenomenological similarity between the specified form of abuse and the associated personality pathology in these three positive findings. Both physical abuse and ASPD imply reliance upon aggressive domination as an interpersonal strategy. Likewise, emotional abuse entails derogation and demeaning of the victim while Cluster C traits imply social anxiety and low self esteem. Finally maternal neglect entails the lack of close, intimate attachment to the primary caregiver while Cluster A traits are characterized by social isolation and avoidance of intimacy. Of interest, the hypothesized relationships that were not supported by the data did not have the same parallels between the specified maltreatment type and the associated form of personality pathology. While borderline PD has been frequently linked to sexual abuse ([Biskin et al., 2011](#); [Ogata et al., 1990](#)), there is no clear rationale why sexual abuse should be preferentially associated with borderline pathology. Likewise, while narcissistic PD traits are often presumed to reflect underlying damage in the sense of self ([Myers and Zeigler-Hill, 2012](#)), narcissistic traits are characterized by inflated rather than deflated self esteem.

As mentioned above, the lack of independent relationship between sexual abuse and borderline personality is not consistent with numerous previous studies ([Wingenfeld et al., 2011](#); [Ogata et al., 1990](#); [Afifi et al., 2011](#)). In fact, in [Afifi et al.'s \(2011\)](#) analysis of NESARC epidemiological data, of all the maltreatment type sexual abuse had the highest adjusted odds ratio predicting to BPD. However, other studies investigating the relationship between different childhood maltreatment types and BPD have found sexual abuse to be a comparable, if not weaker, predictor than other types of maltreatment, including emotional abuse ([Igarashi et al., 2010](#); [Laporte et al., 2011](#)). In our own study, both

sexual and emotional abuse correlated with BPD traits in simple correlations whereas neither retained significance after covariation. Moreover, a meta-analysis of studies of the general population found sexual abuse to lose significance as a predictor of psychopathology after accounting for family environment (Rind and Tromovitch, 1997; Rind et al., 1998). The nature of childhood sexual abuse, however, is a significant modifier of its impact on adult psychological health and not all studies account for this. Severe, invasive abuse and that which involves force or close family members is far more pernicious than less severe and coercive abuse with non-familial perpetrators (Collishaw et al., 2007; Cutajar et al., 2010; Rind and Tromovitch, 1997).

Of note, the sexual abuse measure in our study had fewer significant relationships with all types of personality pathology than did the other maltreatment measures. However, it is likely the measure used played a large part in these negative findings. For the three other maltreatment types, we used multiple measures and identified the most sensitive scale through statistical analysis. We used only one sexual abuse measure, however, and thus could not compare it with similar measures. Additionally, the CTQ sexual abuse scale identifies neither the perpetrator nor the invasiveness of abuse. As above, type of abuse and relationship with perpetrators strongly influences the psychological impact of sexual abuse (Collishaw et al., 2007; Cutajar et al., 2010; Feiring et al., 2002). Thus the failure to identify the perpetrator or nature of the abuse may have reduced the utility of the measure. Additionally, many people feel great shame and embarrassment about sexual abuse histories and may be reluctant to accurately disclose such histories (Feiring et al., 2002). Anecdotally, our research assistants suspected that this might be the case with some of our subjects.

In sum, it is unclear whether our negative findings for Hypothesis 1 reflect: (1) a lack of a specific relationship between sexual abuse and BPD, (2) a lack of an independent relationship between sexual abuse and personality pathology in general, (3) inadequate distinction between the most severe and damaging forms of sexual abuse and more mild and less pathogenic early sexual contact, or (4) confound by self-report biases specific to this type of maltreatment. Thus the relationship between sexual abuse and BPD may be quite complex and requires further research utilizing more precise and nuanced assessments of sexual abuse history.

The lack of association between emotional abuse and narcissistic pathology was less surprising as there is little literature examining this relationship. Although both Afifi et al. (2011) and Johnson et al. (2001) found verbal abuse to independently predict to narcissistic traits, Lobbestael et al. (2010) did not. The constructs of overt and covert narcissism may shed some light on this finding as well as on the divergent associations between narcissistic traits, Cluster C traits and physical abuse. Overt narcissism is characterized by inflated self esteem, sense of superiority and entitlement and high demand for admiration. Covert narcissism, while also involving perturbations in self-esteem, is characterized by deflated self-esteem, tendency towards guilt and shame and excessive sensitivity to criticism. Moreover these two traits may be inversely related (Atlas and Them, 2008; Luchner et al., 2011; Fossati et al., 2010). As such narcissistic PD appears more akin to overt narcissism while Cluster C traits to covert narcissism. Of note, Hoglund et al. (1997) linked emotional abuse to covert narcissistic features of hypersensitivity, hidden grandiosity, and inadequacy. Thus emotional abuse may be more predictive of covert than overt narcissism.

4.2. Unexpected findings

The research design used in this study allowed us to test 20 different associations between maltreatment types and personality

disorder traits. Six significant relationships were found, three of which predicted by a priori hypotheses. That our hypotheses accounted for 50% of the independent relationships found in our study adds support to the specificity of our findings. The remaining three significant associations all pertained to physical abuse. Physical abuse was independently and positively associated with narcissistic PD and Cluster A traits and negatively associated with Cluster C traits. The association with Cluster A traits appears to be driven by paranoid PD traits. While these findings were not expected, they are consistent with the predicted relationship between physical abuse and ASPD traits. There is significant diagnostic overlap between narcissistic and antisocial PDs as DSM-IV-TR criteria for both disorders include egocentricity, lack of empathy, and grandiosity (APA, 2000). Likewise, some individuals with ASPD traits have elevated paranoid traits, presumably a consequence of living an exploitive and predatory lifestyle (Blackburn and Coid, 1999). Finally, Cluster C traits are associated with anxiety and inhibition, as opposed to the disinhibited aggression characteristic of ASPD and physical abuse. In a factor analysis of PD scores from the MCMI, Cluster C and provisional PDs (specifically avoidant, dependent, depressive, and negativistic) loaded highly on an “emotion-internalizing dysfunction” factor while histrionic and narcissistic PD had a strong but negative loading on the same factor. Further, antisocial and drug dependence scales loaded strongly on the “behavioral/externalizing dysfunction” factor (van der Heijden et al., 2012). As this sample includes a subset of subjects with substance use disorders, who tend to have higher levels of antisocial traits (Evren et al., 2006), it is possible that ASPD traits had a stronger influence on patterns of correlations in the dataset than may be found in other samples. Likewise subjects from our dual diagnosis unit had more ASPD traits than those from other services (3.65 ± 1.9 vs. 2.15 ± 1.7 , $t(278) = -4.97$, $p < 0.001$).

4.3. Limitations

The results of this study should be considered in the context of its limitations. For one, the use of a largely inpatient psychiatric population, specifically with a high proportion of substance abuse patients, may reduce generalizability to other populations. Nonetheless, our results are consistent with studies of other clinical and non-clinical populations (Lobbestael et al., 2010; Grilo and Masheb, 2002; Johnson et al., 2001). Further, the rates of maltreatment (i.e., abuse at low levels and above) in this study appear fairly comparable with those of similar clinical populations. Using norms published in the CTQ manual (Bernstein and Fink, 1998), our CTQ scores on average fall in the 78th percentile (60th–95th percentile) of a sample of male adolescent psychiatric inpatients and in the 57th percentile (40th–70th percentile) of a sample of female adolescent psychiatric inpatients. Our reported rates of maltreatment are somewhat lower than those reported by a sample of 409 participants from inpatient, outpatient and forensic treatment settings, who report childhood maltreatment rates averaging 78% (64–95%) across the same five maltreatment types measured in the CTQ (Lobbestael et al., 2010). In contrast our own rates of abuse average 56% (39–69%) by CTQ scores. However, these authors used a clinical interview to assess maltreatment which may have been more sensitive than self-report questionnaires.

Additionally, we used self-report, retrospective measures of childhood maltreatment, which could result in either over or under-reporting or misunderstanding of the questions. In order to minimize the latter problem, however, research assistants read the questions aloud to any subjects who showed hesitation or difficulty in filling out the questionnaires. We also used multiple measures of physical and emotional abuse and neglect, which allowed us to identify the most sensitive measures. Another limitation was the low number of items entered into

the analyses of inter-item consistency. Further, use of measures from different scales may have raised problems with inconsistent or overlapping definitions of abuse by different scale authors. Our primary analyses utilized three scales from the CTQ and one scale from the CTSPC-CA (maternal neglect). As the correlations between the neglect scale and the CTQ scales were of lower magnitude (0.28–0.40) than were those among the CTQ scales (0.41–0.68), the CTSPC scale appears to be sufficiently distinct from the CTQ scales.

Another possible limitation is the use of a single, self-report measure of personality pathology. Self-report measures of personality pathology can suffer from social desirability biases or subjects' poor insight and are often seen as less accurate than semi-structured interviews (Bagby and Farvolden, 2004; Widiger and Coker, 2002). Nonetheless, the PDQ-4+ has proven reliable and valid in numerous studies and correlates well both with self-report personality measures and structured interviews (see Widiger and Coker (2002) for a review). Additionally, although the PDQ-4+ has yielded high rates of false positives when used as a categorical measure (Bagby and Farvolden, 2004), convergent validity is markedly improved when the PDQ4+ is used dimensionally, as was done in this study (Bagby et al., 2005). The more significant limitation involves the use of the CTQ sexual abuse scale as the single measure of sexual abuse. Although we have been able to differentiate subject groups with this measure in previous research (Cohen et al., 2010), this scale did not prove sensitive to any form of personality pathology in the current study. While this could reflect a true finding, it may also reflect limitations of the scale.

Nonetheless, taken within the context of its limitations, this study adds important new information about the specific relationships between distinct forms of childhood maltreatment and personality disorders. Provided these findings are replicated in future research, this information can enhance and refine our treatment of adults with personality disorders as well as child and adult victims of childhood maltreatment.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.psychres.2013.10.036>.

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