

**Title**

Differentiating Symptom Profiles of ICD-11 PTSD, Complex PTSD and Borderline Personality Disorder: A Latent Class Analysis in a Multiply Traumatized Sample

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## Abstract

*Background:* Complex PTSD (CPTSD) has been included as a diagnostic category in the ICD-11 consisting of six symptom clusters; the three PTSD criteria of Re-experiencing, Avoidance, and Hypervigilance, in addition to three Disturbances of Self-Organisation (DSO) symptoms defined as Emotional Dysregulation, Interpersonal Difficulties, and Negative Self-Concept. As Borderline Personality Disorder (BPD) shares similar features to DSO presentations and is commonly associated with PTSD, there is debate as to whether and how CPTSD is distinct from PTSD comorbid with BPD.

*Aim:* To identify groups with distinct profiles of self-reported CPTSD and BPD symptoms and associated trauma history characteristics.

*Method:* A Latent Class Analysis (LCA) using CPTSD and BPD symptom variables was conducted on a sample of 195 treatment-seeking adults at a specialist trauma service. The classes were then compared on demographic and clinical characteristics using a series of ANOVA and chi-square tests.

*Results:* The LCA determined three distinct classes; a CPTSD/High BPD class characterised by high symptom endorsement across both conditions; a CPTSD/Moderate BPD class characterised by high PTSD and DSO symptom endorsement and moderate BPD; and a PTSD/Low BPD class characterised by PTSD symptoms and low DSO and BPD symptom endorsement. The two CPTSD classes were associated with greater exposure to multiple, interpersonal traumas earlier in life and exhibited higher functional impairment.

*Conclusions:* Findings support the construct of a CPTSD diagnosis as a separate entity although BPD features seem to overlap greatly with CPTSD symptoms in this highly traumatised clinical sample.

**Keywords:** Complex PTSD; PTSD; interpersonal trauma; BPD;

## Introduction

Post-Traumatic Stress Disorder (PTSD) is one possible clinical response following exposure to a traumatic stressor, and is defined in the International Classification of Diseases, 11<sup>th</sup> edition (ICD-11) as having three key criteria: re-experiencing the event, for instance through flashbacks and nightmares, avoidance of reminders, and a sense of current threat often presented by excessive hypervigilance. Despite high levels of individuals reporting experiencing traumatic events, research suggests that just 3-8% (McLaughlin et al., 2014; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) go on to develop persistent PTSD. The majority of people appear to be resilient, however traumatic events are also a known risk factor for the development of a myriad of other mental health disorders including anxiety, depression, and substance misuse (Gilbert et al., 2009), and have been implicated in the aetiology of Borderline Personality Disorder (BPD; Winsper et al., 2016).

Complex PTSD (CPTSD) has been introduced as a new diagnostic category in the ICD-11; For a CPTSD diagnosis, individuals firstly must fulfil the criteria for PTSD, as well as symptoms of Disturbances in Self-Organisation (DSO) which includes the domains of emotional dysregulation, negative self-concept, and interpersonal difficulties. Although CPTSD was originally conceptualised to capture the response to multiple, prolonged traumatic events with an early life onset (Herman, 1992), some researchers argued that CPTSD could also result from single, catastrophic events that could occur in childhood or adulthood (Courtois, 2004), such as prolonged torture.

One key controversy has been that the ICD-11 DSO domains of difficulties in emotion regulation, interpersonal relationships, and self-concept has significant overlap with the DSM-V construct of BPD, which conceptualises the disorder as requiring any five of nine symptoms including unstable and intense interpersonal relationships, identity disturbance,

and affective instability. The ICD-11 DSO concept states that these features are each specifically required in addition to PTSD to form the construct of CPTSD. DSM-V BPD, however, includes these and six other features in any combination as long as five are endorsed to meet the construct of BPD. Therefore the labels appear very similar but have unique requirements for ICD-11 CPTSD and DSM-V BPD. Furthermore, the DSO features are inherently cross-diagnostic features and we expect a degree of overlap with other conditions. There are also shared associated difficulties of dissociation, impulsivity, and self-harm, and BPD is commonly associated with a history of early traumatic experiences (Yen et al., 2002). Many studies demonstrate high comorbidity rates with one such study showing a 39.2% lifetime prevalence for PTSD in a BPD sample (Grant, Beck, Marques, Palyo, & Clapp, 2008). The high rates of comorbidity and overlap in clinical features have led to the hypothesis that CPTSD could be equivalent to BPD comorbid with PTSD, calling into question the clinical utility of CPTSD as a separate diagnostic entity. The rates of PTSD may be higher in BPD than in the general population, however research has demonstrated that the rates are similar to other personality disorders (Golier et al., 2003; Yen et al., 2002). This weakens the argument that CPTSD represents comorbid BPD/PTSD, as the same association is seen in other personality disorders that have difficulties beyond their shared criteria. Instead, it gives weight to the hypothesis that people with personality disorders may be more vulnerable to being exposed to traumatic events and/or developing PTSD.

Although there is a large degree of overlap between the risk factors and presentations of CPTSD and BPD, there is a growing field of research demonstrating their differences. The two constructs share difficulties in emotion regulation, yet this presents markedly differently for both. For CPTSD, emotion dysregulation is commonly in the form of reactive anger and substance misuse, whereas for BPD this is expressed as self-injurious behaviours and suicidality (Cloitre et al., 2014). Both disorders express disturbances in sense of self, within

BPD this is noted as being highly unstable and alternating between polarised positive and negative self-perception, however in CPTSD the sense of self is defined as a stable, deeply negative self-perception. Difficulties with relationships are characterised as volatile and oscillating between intensely idealised and disparaging in BPD, yet in CPTSD relationship difficulties stem from mistrust, associated with being hurt, and are kept at a distance more consistently (Brewin et al., 2017). Although each of these characteristics are labelled similarly, the formulation underpinning them and the specific nature of their expression are meaningfully different. The conceptualisation of these presentations has substantive implications for diagnosis, assessment and treatment directions. A CPTSD or BPD diagnosis could determine whether a help-seeking individual is perceived as a survivor who could benefit from trauma-focused therapies, or someone with long-standing personality difficulties who requires management of self-injury (Quadrio, 2005). It is therefore imperative that research can investigate the differences between the two conditions. An accurate description of the disorders is important for the development of standardised assessment and effective treatment for CPTSD.

A handful of studies have investigated the overlap between ICD-11 CPTSD and BPD (Cloitre et al., 2013; Cloitre et al., 2014; Knefel et al., 2016). Cloitre et al. (2013) demonstrated unique classes of PTSD and CPTSD in their sample of 302 treatment-seeking individuals, predominantly females (89.1%), at a specialist trauma clinic and further demonstrated that their results did not change whether they ran the analysis with or without the BPD sub-group. In a further study, Cloitre et al. (2014) used Latent Class Analysis in a trial sample of 280 women who had experienced childhood abuse. The analysis identified four distinct classes that differentiated CPTSD, PTSD, BPD and a low symptom class. Finally, Knefel et al. (2016) recruited a sample of survivors seeking compensation for institutional child abuse (n=216). This is the only study where CPTSD was assessed using a

dedicated measure such as ICD-11 Trauma Questionnaire (ITQ; Cloitre, Roberts, Bisson, & Brewin, 2015). Using a network analysis two clusters were identified; a PTSD group with some affect dysregulation symptoms, and a second with all other DSO symptoms and BPD disturbances in relationships. The BPD symptom network was not closely related to those of PTSD and DSO and therefore suggested that CPTSD represents a qualitatively different presentation to comorbid PTSD and BPD.

Previous research regarding the overlap between CPTSD and BPD has included predominantly female samples and survivors of childhood sexual abuse; these groups in particular have been associated with higher levels of BPD symptomatology (Zanarini et al., 2002) which limits the generalisability of findings. No study has yet included survivors from a range of interpersonal and non-interpersonal traumatic events, nor had balanced gender samples. No study has yet applied the LCA approach using a measure dedicated to the assessment of CPTSD and only one study in the area has used such a measure. Considering the limitations of previous studies, the present study explored the relationships between PTSD, CPTSD, and BPD using a dedicated measure on a mixed-gender sample with a history of a wide range of traumatic experiences in childhood and adulthood. An exploratory LCA approach will be applied with CPTSD and BPD characteristics as variables.

The hypotheses for the current study are:

1. There will be distinct groups with differences in their CPTSD and BPD symptom profiles. The profiles will differ qualitatively as well as quantitatively thus distinguishing CPTSD as a separate construct.
2. The CPTSD construct will be associated with earlier, multiple, and interpersonal forms of trauma compared to PTSD or BPD.

3. PTSD will be more associated with single events, occurring predominantly in adulthood, of a non-interpersonal nature compared to CPTSD or BPD.

## **Method**

The current study utilised a secondary dataset originally used by Karatzias et al. (2017) for a study that explored the symptom profiles of PTSD and CPTSD using the ITQ. The original data were collected through a National Health Service (NHS) trauma centre in Scotland, which accepts referrals from general practitioners, psychiatrists, or psychologists for psychological therapy. All new referrals during the 18 month recruitment period were invited to complete a pack of standardised measures via post. Out of 230 referrals, 22 did not respond (giving a response rate of 90.4%) and 13 referrals provided incomplete data. This resulted in a final sample size of 195.

The mean age of the sample was 41 years ( $SD=12.4$ ) with a female majority (65.1%). The majority of the sample were White British (88.7%), with 69.8% being Scottish. The highest level of academic attainment in this sample were 38.5% school completers, 30.2% had completed college, and 30.2% had completed university. In terms of employment, 33.2% were employed (20.2% full-time; 13.0% part-time), 38.9% were unemployed, 7.3% were retired, and 5.7% were engaged in voluntary work.

## **Measures**

### **ICD-11 Trauma Questionnaire (ITQ; Cloitre et al., 2015)**

In its current form, the ITQ is a 23-item self-report measure that screens PTSD and CPTSD in line with ICD-11 criteria. Six items represent the three clusters of PTSD; Re-experiencing, Avoidance, and Sense of Threat. CPTSD includes PTSD as well as three clusters reflecting Disturbances in Self-Organisation (DSO); Affective Dysregulation (AD),

Negative Self-Concept (NSC), and Disturbances in Relationships (DR), all captured by 16 items. The endorsement of symptoms is scored on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely), indicating how much a symptom has affected them in the past month. AD is assessed by nine questions such as “When I am upset, it takes me a long time to calm down.”, NSC by four questions such as “I feel like a failure.”, and DR by three items such as “I avoid relationships because they end up being too difficult or painful.”

The Likert scores can be recoded into six binary variables that in turn demonstrate meeting criteria for ICD-11 PTSD or CPTSD based on the following cut-off scores. A diagnosis of PTSD requires scoring  $\geq 2$  [moderately (2), quite a lot (3), extremely (4)] for at least one symptom in each of its three clusters. A diagnosis of CPTSD requires PTSD and the following scores for each of the three DSO clusters. Each DSO cluster requires a sum that is half of the total possible score. AD requires a score of  $\geq 10$  on items 1–5 (hyper-activation) or a score of  $\geq 8$  on items 6–9 (deactivation). NSC requires a score of  $\geq 8$  and DR requires a score of  $\geq 10$ . Validation research has demonstrated good factorial validity, composite and discriminant reliability (Hyland et al., 2017; Karatzias et al., 2016)

### **BPD Symptoms**

A subscale to screen for BPD symptoms was included. This was a 14-item self-report measure based on the BPD module of the Structured Clinical Interview (SCID-II) for DSM-IV. The items map onto nine domains of BPD. Six of these nine symptoms (abandonment, unstable relationships, impulsivity, affective instability, feeling empty, and dissociation) were measured using a single item. Three symptoms (unstable sense of self, suicidal/ self-injury, and anger) were measured using multiple items (four, two, and two, respectively) and endorsement of one symptom within each of these clusters indicates symptom endorsement.



Each item was responded to using a binary ‘Yes’ (1) or ‘No’ (0) response format. This is not a diagnostic tool.

### **Child Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)**

The CTQ is a 28-item self-report questionnaire that assesses history of childhood sexual, physical and emotional abuse and physical and emotional neglect. Each subscale is comprised of 5 items, rated on a 5 point scale from “never true” to “very often true”. The CTQ cut-off for sexual abuse is  $\geq 6$ , physical abuse  $\geq 8$ , emotional abuse  $\geq 9$ , physical neglect  $\geq 8$ , and emotional neglect  $\geq 10$ . The factor scales show moderate to high internal consistency and test-retest correlations from .80 to .83, with reported sensitivity of 89% and specificity of 97% in clinical and community samples (Bernstein & Fink, 1998; Bernstein et al., 2003).

### **Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004)**

LEC is a 17-item self-report measure for potentially traumatic events in the respondent's lifetime. The LEC assesses exposure to 16 events plus one item assessing any other extraordinarily stressful event. The respondent checks whether they (a) directly experienced, (b) witnessed, (c) learned about, (d) are not sure, and (e) does not apply to them. The LEC has demonstrated adequate reliability and validity. It is a descriptive measure and therefore does not have a cut-off.

### **The Work and Social Adjustment Scale (WSAS; Mundt, Marks, Shear, & Greist, 2002)**

The WSAS is a 5-item self-report scale capturing the level of functional impairment caused by a mental health problem. It is scored on a 9-point Likert scale from 0 (no impairment) to 8 (very severe impairment) and covers the domains of work, home management, social leisure, private leisure, and ability to form and maintain close relationships. The WSAS is scored out of 40, with higher scores indicating greater

impairment. The scale has demonstrated good internal consistency and test-retest reliability, in addition to showing sensitivity to self-perception of disorder severity.

### **Statistical Analysis**

In order to differentiate the presentations of PTSD, CPTSD, and BPD, an exploratory latent class analysis (LCA) was conducted. LCA is a subset of structural equation modelling that identifies unobserved constructs from multivariate categorical data. The LCA determined the best fitting model of classes based on the six diagnostic symptom criteria including three for PTSD (Intrusions, Avoidance, Hyperarousal), and three for CPTSD (Emotion Regulation, Negative Self Concept, Disturbed Relationships). The LCA also included nine characteristics of BPD (Abandonment, Relationships have ups and downs, Unstable Sense of Self, Impulsiveness, Self-Injury, Mood Changes, Empty, Temper Outbursts, and Dissociation) in the analysis, incorporating fifteen variables in total. The fit of models from one class through to six classes was then evaluated. The models were estimated using robust maximum likelihood (Yuan & Bentler, 2000). To avoid solutions based on local maxima, 500 random sets of starting values were used initially and 100 final stage optimizations.

The relative model fit for each class model was evaluated using three information theory-based fit statistics; the Bayesian Information Criterion (BIC; Schwartz, 1978), sample-size adjusted BIC (ssaBIC; Sclove, 1987), and the Akaike Information Criterion (AIC; Akaike, 1987). The lower the values, the better the comparative fit of the model to the k-1 class model. Simulation studies demonstrate the BIC as the more favourable criterion for identifying the most appropriate number of classes (Nylund, Asparouhov, & Muthén, 2007) and therefore this value was prioritised. Following selection of the best fitting number of classes, the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LRT; Lo, Mendell, & Rubin,

2001) can be used to confirm the model selection. A significant test shows that a model is a better fit than the k-1 model. Analyses were conducted using MPlus 8.0 (Muthen & Muthen, 1998-2017). The classes were subsequently examined for differences on demographic variables and traumatic event history characteristics with univariate statistics (chi-square and ANOVA). Finally, no *a priori* power analysis was conducted as there was insufficient previous research to determine the number and nature of the latent classes. However, Nylund, Asparouhov and Muthén (2007) conducted an extensive Monte Carlo simulation study and found that a sample size of 200, with 15 indicators and a ‘simple’ 3-class solution provided the LRT with power of 1.00 and the BIC always identified the correct model over all replications.

## **Results**

### **Sample Exposure**

Participants reported being exposed to an average of 7.67 (SD = 3.10) life events. The majority of these happened directly to participants (71.24%), compared to being witnessed or learned about. Only a small number (2.1%) experienced a single event and over half (55.4%) had experienced seven events or above. The CTQ scores showed high levels of childhood trauma, the most common forms being Emotional Neglect (83.1%) and Emotional Abuse (81.5%), followed by Physical Abuse (67.7%), Physical Neglect (66.2%), and Sexual Abuse (55.9%). Overall the results show that the sample was multiply traumatised.

### **Diagnostic Rates**

The diagnostic rates for ICD-11 CPTSD and PTSD symptoms are shown in Table 1. The diagnostic rates were high across the sample, with 36.8% meeting criteria for PTSD and

53.4% for CPTSD. The BPD scale indicated that 79.0% of the sample endorsed five or more BPD characteristics.

*Table 1. Sample Proportions endorsing criteria for PTSD, CPTSD, and BPD*

<b>ICD-11 Diagnostic Category</b>	<b>n (%)</b>
<i>PTSD</i>	71 (36.8)
<i>CPTSD</i>	103 (53.4)
<i>Neither PTSD nor CPTSD</i>	19 (9.8)
<i>BPD Symptoms</i>	
Abandonment	126 (66.3)
Relationships have ups and downs	128 (67.7)
Unstable Sense of Self	169 (88.5)
Impulsivity	138 (72.3)
Self-Injury/Suicide Attempt	134 (70.2)
Mood Changes	145 (76.3)
Emptiness	165 (86.4)
Temper Outbursts	89 (46.8)
Dissociation	141 (73.8)

### **Latent Class Analysis**

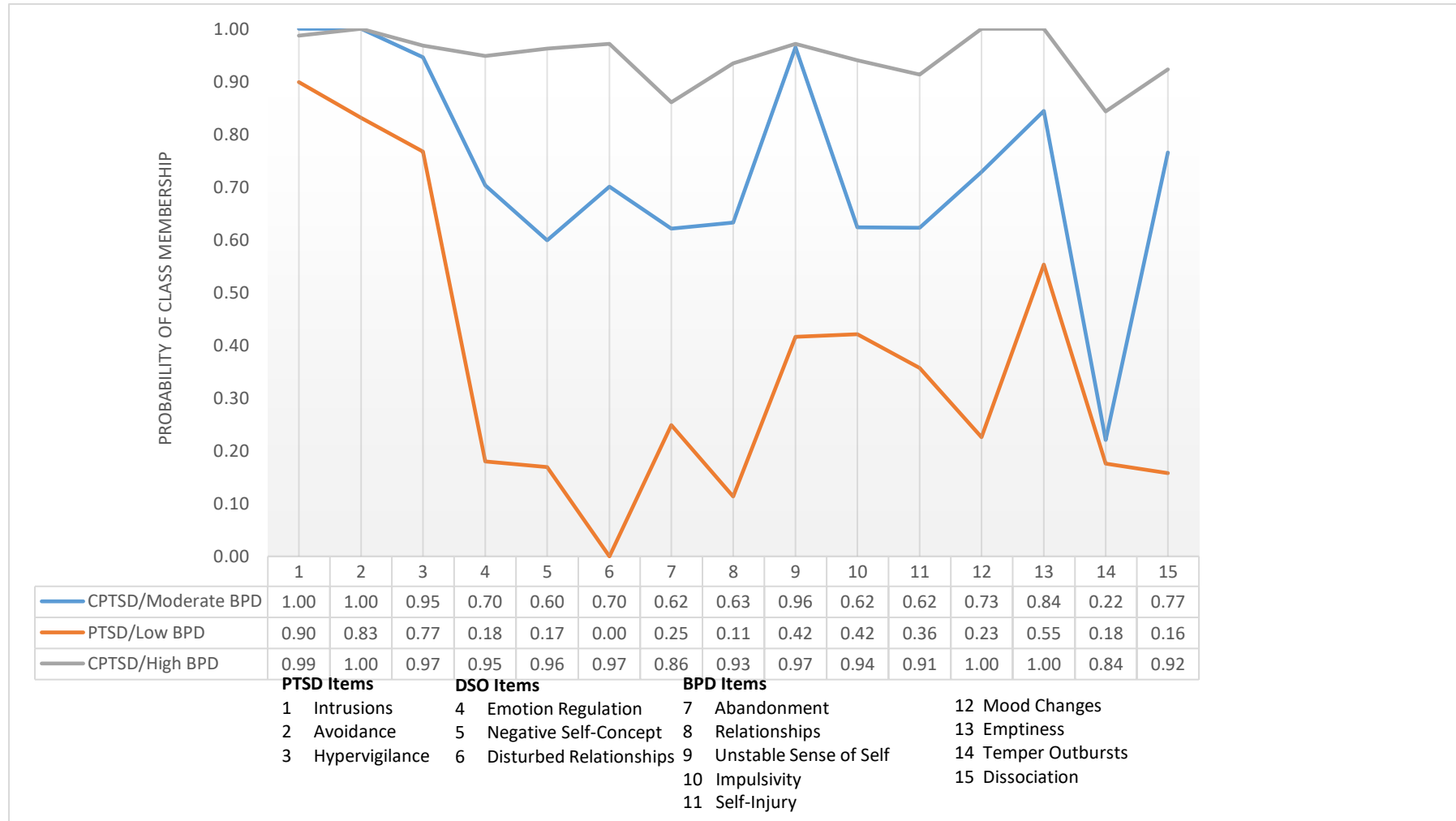
The model fit indices are shown in Table 2. The 3-class model produced the lowest AIC and BIC values and the LRT became non-significant for the 4-class solution. The lowest ssaBIC was for the 3-class model out of those with LRT significance. The 3-class solution was judged as the best fitting model based on the fit statistics and parsimony.

*Table 2. Model Fit Statistics for k1-6 Latent Classes*

<b>Classes</b>	<b>Loglikelihood</b>	<b>AIC</b>	<b>BIC</b>	<b>ssaBIC</b>	<b>LRT P</b>	<b>Entropy</b>
1	-1409.939	2849.877	2898.972	2851.455	-	
2	-1214.901	2491.802	2593.265	2495.062	385.506 .000*	0.897
3	-1170.551	2435.103	2588.934	2440.045	87.660 .037*	0.810
4	-1147.946	2421.891	2628.090	2428.516	44.682 .162	0.881
5	-1126.718	2411.435	2670.002	2419.742	41.959 .500	0.892
6	-1106.905	2403.810	2714.745	2413.799	39.161 .064	0.897

The profile plot for the three class solution is presented in Figure 1.

Figure 1. A profile plot to show the distributions within the k=3 Class model



Running head: The Overlap of Complex PTSD and BPD

Class 1 (N= 84, 43.1%) was the largest class and was characterised by high probabilities of endorsing symptoms for all of the PTSD, DSO, and BPD variables. This class was labelled the “CPTSD/High BPD” Class. Class 2 (N= 78, 40.0%) was defined by a high probability of endorsing PTSD and DSO symptoms, with moderate endorsement of BPD. This class was labelled the “CPTSD/Moderate BPD” Class. Class 3 (N= 33, 16.9%) was the smallest class and was defined by a high probability of endorsing PTSD symptoms, and low probabilities of endorsing DSO and BPD symptoms; this was labelled the “PTSD/low BPD” Class. In conclusion, the analysis identified that three classes best described the data, two of which demonstrated high probabilities of endorsing CPTSD criteria with moderate to high probabilities of endorsing BPD symptoms. The third class had low probabilities of DSO and BPD symptoms but high a probability of PTSD.

As the model was not designed to investigate significant differences and overlap between individual BPD and DSO items, there is not enough power to reliably compare these within the LCA model. However, the estimated probabilities shown in Figure 1 illustrate the differences between each class on the domains of PTSD, DSO, and BPD. The PTSD/low BPD class scores lower than the CPTSD classes on all PTSD symptoms, indicating that those with DSO and BPD symptoms also demonstrate an increased severity of their core PTSD presentation. Classes 1 and 2 differed on all DSO symptoms, indicating an increased severity in the CPTSD/High BPD group. The CPTSD/High BPD group differed from the CPTSD/Moderate BPD group on all BPD symptoms with the exception of an Unstable Sense of Self. This could indicate a shared feature relating to the common trauma background. The only symptoms that did not differ between CPTSD/Moderate BPD and PTSD/low BPD were Impulsivity and Temper Outbursts. These features were significantly more prevalent in CPTSD/High BPD indicating that these domains may be more associated with elevated BPD symptoms.

## Class Characteristics

The demographic variables for each class are shown below in Table 3. The classes did not vary with regard to gender, country, marital status, living arrangements, or employment. However, significant differences were found in age, education, and prescription of psychotropic medication. Those in Class 1 tended to be younger, less likely to go to university, and more likely to be taking psychotropic medications than those in Classes 2 or 3. In conclusion, those with higher probabilities of CPTSD and BPD symptoms indicated greater levels of impairment.

Table 3. Descriptive characteristics of the three classes

<b>Characteristic</b>	<b>Class 1: CPTSD/High BPD N=84 (43.1%)</b>	<b>Class 2: CPTSD/Moderate BPD N=78 (40.0%)</b>	<b>Class 3: PTSD/Low BPD N=33 (16.9%)</b>	<b>Significance test</b>
Age	37.74 (SD: 11.3) <sup>a</sup>	43.92 (SD: 11.8) <sup>b</sup>	40.88 (SD: 14.7) <sup>a, b</sup>	.006*
<i>Gender</i>				
Female	50 (59.5) <sup>a</sup>	50 (64.1) <sup>a</sup>	27 (81.8) <sup>a</sup>	
Male	34 (40.5) <sup>a</sup>	28 (35.9) <sup>a</sup>	6 (18.2) <sup>a</sup>	.073
<i>Country</i>				
UK	73 (86.8) <sup>a</sup>	68 (87.2) <sup>a</sup>	27 (81.8) <sup>a</sup>	.440
<i>Marital Status</i>				
Married/Cohabiting	21 (25.0) <sup>a</sup>	24 (30.8) <sup>a</sup>	18 (54.5) <sup>b</sup>	
Single	62 (73.8) <sup>a</sup>	53 (67.9) <sup>a</sup>	15 (45.5) <sup>b</sup>	.010*
<i>Education</i>				
High School	31 (36.9) <sup>a</sup>	34 (43.6) <sup>a</sup>	10 (30.3) <sup>a</sup>	
College	34 (40.5) <sup>a</sup>	18 (23.1) <sup>b</sup>	6 (18.2) <sup>b</sup>	
University	17 (20.2) <sup>a</sup>	24 (30.8) <sup>a</sup>	17 (51.5) <sup>b</sup>	.005*
<i>Employment</i>				
Employed	28 (33.3) <sup>a</sup>	22 (28.2) <sup>a</sup>	18 (54.5) <sup>b</sup>	
Unemployed	50 (59.5) <sup>a</sup>	49 (62.8) <sup>a</sup>	9 (27.3) <sup>b</sup>	
Retired	4 (4.8) <sup>a</sup>	6 (7.7) <sup>a, b</sup>	6 (18.2) <sup>b</sup>	
Student	1 (1.2) <sup>a</sup>	0 (0.0) <sup>a</sup>	0 (0.0) <sup>a</sup>	.010*
On Psychotropic Medication	64 (76.2) <sup>a</sup>	54 (69.2) <sup>a</sup>	13 (39.4) <sup>b</sup>	.001*



The classes demonstrated differences in their experiences of traumatic events. These are illustrated in Table 4. Classes differed significantly across all experiences, with Class 1 reporting the highest levels on the LEC and CTQ subscales. Class 1 were more likely to endorse multiple forms of childhood abuse on the CTQ, have the index event they were seeking treatment for be of an interpersonal nature, and this event typically occurred longer ago. Therefore, higher probabilities of CPTSD and BPD symptoms demonstrated an association with a more severe trauma history in terms of number and types of events.

Table 4. Traumatic experiences by class

Trauma	Class 1: CPTSD/High BPD	Class 2: CPTSD/Moderate BPD	Class 3: PTSD/Low BPD	F Value	Significance Test (p value)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)		
Life Events Checklist Total	8.60 (2.90) <sup>a</sup>	7.47 (2.90) <sup>a</sup>	5.82 (3.19) <sup>b</sup>	10.826	<.001*
<i>Child Trauma Questionnaire</i>					
Emotional Abuse	16.6 (5.97) <sup>a</sup>	13.61 (6.47) <sup>b</sup>	9.26 (6.07) <sup>c</sup>	16.365	<.001*
Physical Abuse	12.22 (6.23) <sup>a</sup>	10.15 (5.53) <sup>a, b</sup>	7.84 (4.58) <sup>b</sup>	7.138	.001*
Sexual Abuse	14.46 (8.35) <sup>a</sup>	11.96 (7.89) <sup>a, b</sup>	8.29 (5.92) <sup>b</sup>	7.253	.001*
Emotional Neglect	15.33 (5.91) <sup>a</sup>	13.19 (6.29) <sup>a</sup>	9.35 (4.92) <sup>b</sup>	11.631	<.001*
Physical Neglect	11.12 (5.49) <sup>a</sup>	9.20 (4.60) <sup>b</sup>	6.16 (2.08) <sup>c</sup>	12.713	<.001*
	Class 1: CPTSD/High BPD	Class 2: CPTSD/Moderate BPD	Class 3: PTSD/Low BPD	df	Significance Test (p value)
	N (%)	N (%)	N (%)		
<i>Child Trauma Questionnaire</i>					
>2 forms of abuse	77 (91.7) <sup>a</sup>	65 (83.3) <sup>a</sup>	20 (60.6) <sup>b</sup>	2	.000*
Adulthood Index event	40 (47.6) <sup>a</sup>	45 (57.7) <sup>a, b</sup>	24 (72.7) <sup>b</sup>	2	.019*
Both Child and Adult Trauma	37 (44.0)	35 (44.9)	12 (36.4)	2	.522
Interpersonal Index Event	56 (66.7) <sup>a</sup>	46 (59.0) <sup>a</sup>	11 (33.3) <sup>b</sup>	2	.002*
<i>Time Since Index Event</i>					
<6 months	2 (2.4) <sup>a</sup>	3 (3.8) <sup>a, b</sup>	4 (12.1) <sup>b</sup>	10	.002*
6-12 months	5 (6.0) <sup>a</sup>	8 (10.3) <sup>a</sup>	4 (12.1) <sup>a</sup>		
1-5 years	14 (16.7) <sup>a</sup>	15 (19.2) <sup>a</sup>	16 (48.5) <sup>b</sup>		
5-10 years	13 (15.5) <sup>a</sup>	10 (12.8) <sup>a</sup>	2 (6.1) <sup>a</sup>		
10-20 years	19 (22.6) <sup>a</sup>	9 (11.5) <sup>a, b</sup>	2 (6.1) <sup>b</sup>		
>20 years	22 (26.2) <sup>a</sup>	22 (28.2) <sup>a</sup>	3 (9.1) <sup>b</sup>		

### Post-hoc Tests

Analyses using Scheffé post-hoc comparisons indicated that total endorsement of LEC events was not significantly different between Classes 1 and 2, however Class 3 reported significantly fewer events than Class 1 ( $p < .001$ ) and Class 2 ( $p = .029$ ). Emotional

Abuse was significantly higher in Class 1 than Class 2 ( $p=.012$ ) and Class 3 ( $p<.001$ ), and higher in Class 2 than in Class 3 ( $p=.005$ ). Physical Abuse was not significantly different between Class 1 and Class 2 or between Class 2 and Class 3, however Class 1 reported significantly higher than Class 3 ( $p=.002$ ). There was no significant difference in Sexual Abuse across Classes 1 and 2, or Classes 2 and 3, however Class 1 reported significantly more than Class 3 ( $p=.001$ ). Emotional Neglect was not significantly different between Classes 1 and 2, however Class 3 reported significantly less than Class 1 ( $p<.001$ ) and Class 2 ( $p=.011$ ). Physical Neglect was significantly higher in Class 1 than Class 2 ( $p=.041$ ) and Class 3 ( $p<.001$ ), and higher in Class 2 than Class 3 ( $p=.012$ ). Overall, these results indicate that higher probabilities of CPTSD and BPD symptoms are associated with a greater number and severity of adulthood and childhood traumatic events. Emotional Abuse and Physical Neglect were the only variables to distinguish CPTSD/High BPD from CPTSD/Moderate BPD.

In terms of level of exposure, post-hoc analyses indicated that Classes 1 and 2 were significantly more likely to experience multiple forms of child abuse than Class 3 ( $p<.001$ ) however there was no difference between Class 1 and 2. Class 3 were significantly more likely to have an index traumatic event occurring in adulthood than Class 1 ( $p<.05$ ). There was no significant difference between Class 1 and Class 2, nor Class 2 and Class 3. There was no significant difference between any of the classes in the likelihood of experiencing both childhood and adult trauma. Therefore the classes with higher level of DSO and BPD symptoms were associated with a background of earlier and multiple forms of abuse.

Classes 1 and 2 were significantly more likely to have an index event of an interpersonal nature than Class 3 ( $p=.002$ ), with no difference between Classes 1 and 2. Class 3 were more likely to have experienced their index event in the last six months ( $p<.05$ ), whereas there was no difference between Class 1 and 2, nor Class 2 and 3. There were no

differences in the likelihood of experiencing trauma 6-12 months or 5-10 years ago across the classes. Class 3 was significantly more likely to endorse an index trauma 1-5 years ago than Classes 1 or 2 ( $p < .05$ ), with no difference between Class 1 and 2. Class 1 was significantly more likely to have an index event 10-20 years ago than Class 3 ( $p < .05$ ) with no difference between Class 1 and 2, nor Class 2 and 3. Classes 1 and 2 were more likely to have the index event over 20 years ago than Class 3 ( $p < .05$ ), with no difference between Classes 1 and 2. Overall, these results indicate the classes with higher CPTSD and BPD symptoms were more likely to have interpersonal index events from longer ago, whereas the PTSD class was more likely to include those with non-interpersonal events from the past five years or less.

The classes exhibited significant differences in their levels of functional impairment as a consequence of trauma symptoms. The full results are detailed below in Table 5.

Table 5. A One-Way Analysis of Variance on the functional impairment by class using the Work and Social Adjustment Scale

<b>WSAS Functioning Domain</b>	<b>Class 1: CPTSD/High BPD Mean (S.D.)</b>	<b>Class 2: CPTSD/ Moderate BPD Mean (S.D.)</b>	<b>Class 3: PTSD/Low BPD Mean (S.D.)</b>	<b>F Value</b>	<b>Significance Test</b>
Work	6.51 (1.66) <sup>a</sup>	6.08 (2.04) <sup>a</sup>	6.04 (2.38) <sup>a</sup>	1.060	.349
Home Management	5.27 (2.36) <sup>a</sup>	4.78 (2.24) <sup>a</sup>	3.48 (2.49) <sup>b</sup>	6.876	.001*
Social Leisure	6.60 (1.54) <sup>a</sup>	5.79 (2.24) <sup>a</sup>	4.70 (2.79) <sup>b</sup>	10.247	<.001*
Private Leisure	5.51 (2.49) <sup>a</sup>	5.22 (1.97) <sup>a,b</sup>	4.24 (2.92) <sup>b</sup>	3.361	.037*
Relationships	6.62 (1.55) <sup>a</sup>	5.58 (2.20) <sup>b</sup>	3.52 (2.69) <sup>c</sup>	27.082	<.001*
Total	29.88 (6.77) <sup>a</sup>	25.50 (7.44) <sup>b</sup>	20.70 (10.70) <sup>c</sup>	17.456	<.001*

The groups differed significantly across functioning in Home Management, Social Leisure, Private Leisure, Relationships, and Total, with Class 1 reporting the highest levels of impairment across these domains. There were no significant differences with ability to work for those who were in employment. The classes with higher DSO and BPD symptoms are

associated with greater impairment across most areas of functioning, with relationships and overall functioning particularly impaired in those with higher BPD symptoms.

### **Discussion**

The present study explored differences in clinical presentations and traumatic event profiles of PTSD, CPTSD, and BPD characteristics in a specialist trauma sample. LCA confirmed three classes, which were labelled CPTSD/High BPD, CPTSD/Moderate BPD, and PTSD/Low BPD. The first hypothesis that there would be differences in the clinical presentations between CPTSD and BPD was confirmed, however the study suggests that CPTSD and BPD also have strongly overlapping features. The second hypothesis that CPTSD would be more strongly associated with earlier, multiple, and interpersonal forms of trauma was also confirmed. The CPTSD classes were associated with greater functional impairment, with elevated BPD symptoms particularly associated with relationship impairment. The PTSD/Low BPD class was more strongly associated with adulthood index events occurring in the last five years and supported the third hypothesis. At symptom level, an unstable sense of self was the most common factor between the CPTSD classes, whereas impulsivity and temper outbursts differentiated the CPTSD/Moderate BPD class from the PTSD/Low BPD class. CPTSD presentations have higher levels of exposure to early, interpersonal traumatic events and are characterised by greater functional impairment relative to PTSD.

Our results extend findings from previous research on the association between BPD and CPTSD. Cloitre et al. (2013) distinguished between CPTSD and PTSD however found that 33.7% of the CPTSD class endorsed seven or above BPD characteristics, as did 15% of the PTSD class, and even 11.9% of the Low Symptom class. The current study also distinguished between CPTSD and PTSD classes while demonstrating the presence of BPD

symptoms across the classes. These findings point towards an overlap with BPD difficulties particularly at the CPTSD end of the spectrum. However, Cloitre et al. (2014) did not find a strong overlap between CPTSD and BPD features and there are key differences between these studies that may explain the discrepancy. Firstly, this analysis came before a standardized CPTSD tool was available, whereas the present study uses the ITQ. It also focused on female survivors of childhood abuse, whereas the current study included male and female survivors of child and/or adulthood trauma from a specialist clinic. It may be that BPD symptoms only demonstrate a strong degree of overlap in multiply traumatized clinical samples as in the present study, with this relationship less evident at the community level. There is clearly a need for further work to explore the association between CPTSD and BPD features in various trauma samples.

Knefel et al. (2016) found BPD symptoms to be distinct from symptom networks for PTSD and DSO, however demonstrated a grouping of three DSO symptoms (anger, reckless behaviour, feeling distant from others) with one BPD item (identity disturbance). The sample's endorsement of BPD symptoms ranged from 32.4-55.3%, whereas in the current sample ranged from 45.6-86.7%. Again, differences at symptom endorsement levels can be attributed to severe traumatisation reported by the participants in our sample.

An overlap in symptoms has significant implications for the developing field of CPTSD research and practice. With BPD symptoms evident across the sample, following replication it will be important to routinely screen for BPD symptoms when assessing for CPTSD, and similarly, to account for PTSD in assessments for BPD. An 'Unstable sense of self' was identified as a shared characteristic across the CPTSD classes and this mirrors previous findings of shared identity disturbance (Knefel et al., 2016). This feature may stem from a common trauma background as it was not dependent on BPD symptom severity. A more careful investigation using measures that sensitively differentiate between BPD identity

disturbance and DSO negative self-concept is needed. Unpacking this relationship requires further research in a range of samples as it may form an important treatment target and contribute to understanding the comorbidity.

Forms of interpersonal abuse rarely occur in isolation (Kuo, Khoury, Metcalfe, Fitzpatrick, & Goodwill, 2015). Emotional neglect is unsurprisingly commonly present alongside other forms of trauma, for example it is difficult to imagine an individual experiencing physical abuse without also having their emotional needs disregarded. Our sample demonstrated that 83.1% had in fact experienced emotional neglect, and the severity of such childhood abuse was associated with more severe symptomatology. Multiple traumatisation was the norm in our sample; the sense of self and emotion regulation strategies have been theorised to develop in the context of secure attachment relationships (Mikulincer, Shaver, & Pereg, 2003), exposure to repeated trauma may predispose individuals to a disturbed sense of self which in turn could develop into BPD or CPTSD. Emotional dysregulation may also increase vulnerability to developing PTSD through a tendency to perceive events as threatening and traumatic, an inability to tolerate high levels of distress, and poor utilisation of social support (Ford & Courtois, 2014). This might explain why a higher proportion of individuals with BPD symptoms are seen in trauma clinics. It will be crucial to investigate how these constructs relate; to determine whether they emerge post-trauma, and whether their expression is impacted by trauma treatment.

Temper outbursts and impulsivity differentiated CPTSD/Moderate BPD from both CPTSD/Moderate BPD and PTSD/Low BPD, suggesting these features link to BPD severity. Temper outbursts were a differentiating factor in Cloitre et al. (2014), being attributed to BPD much more strongly than to CPTSD. These findings could indicate a clinical feature for differential diagnosis.

Interventions for multiply traumatised groups may need to concurrently address CPTSD, BPD symptoms and impaired functioning. Certain BPD symptoms may be particularly important to target, as individuals with highly unstable relationships and strong fears of abandonment will have difficulty engaging in a stable therapeutic relationship to undertake trauma work. If BPD is truly comorbid with PTSD, then Dialectical Behaviour Therapy (DBT) with Prolonged Exposure (PE) would be indicated (Harned, Korslund, Foa, & Linehan, 2012). It has been advocated that CPTSD can be targeted with phase-based approaches where initial stabilisation and skills development (phase 1 interventions) facilitates a sense of safety, such as in the Skills Training in Affect and Interpersonal Regulation (STAIR) intervention (Cloitre, Koenen, Cohen, & Han, 2002) which can be an effective precursor to trauma treatment. Recent evidence suggests that phase 1 psychoeducational interventions are not particularly useful for complex interpersonal trauma (Mahoney, Karatzias, & Hutton, 2019). As yet, there has been no systematic investigation into CPTSD interventions, although a recent meta-analysis suggests that existing interventions such as CBT and EMDR are less effective for symptoms of CPTSD as a result of childhood trauma (Karatzias et al., 2019). Considering that both presentations appear to have strong associations with multiple traumatic events, it will be of paramount importance to assess the impact of trauma-focused treatments on BPD symptoms over time.

Although PTSD is reported widely in BPD and understanding their connection holds important implications for practice, it may be becoming a bottleneck in the field where we risk an overemphasis being placed on the relationship despite evidence to the contrary. This could mean losing sight of wider factors influencing these presentations. Traumatic experiences are reported commonly by the general population as well as people with other personality disorders. In fact, a recent meta-analysis identified paranoid personality disorder as being the most common personality disorder comorbidity to PTSD, followed by avoidant



and then borderline types (Friborg et al., 2013). Approximately one third of BPD patients report no abuse at all (Paris, 1998) indicating that BPD can develop in the apparent absence of trauma. Trauma exposure and PTSD may not be exclusively elevated in BPD but is implicated across pathological personality development. Thus it might be useful to explore similarities between CPTSD and personality disorders other than BPD.

Traumatic events are a risk factor for a range of psychopathologies and personality traits beyond CPTSD and BPD. Investigating disorders at the symptom level will allow the field to adopt a more trans-diagnostic view of presentations and provide more confidence in differentiating between them. It will allow researchers to investigate important questions of whether traumatic events increase the risk of developing a range of disorders, whether having PTSD increases vulnerability to other disorders, or whether other disorders increase the likelihood of being exposed to traumatic events and vulnerability to PTSD. Or perhaps the diagnostic criteria as currently defined casts too wide a net leading to higher crossover between disorders (Lockwood & Forbes, 2014). These are questions that impact the field of mental health more broadly and are an important context within which to develop the emerging understanding of CPTSD.

The present findings are to be interpreted cautiously considering that BPD symptoms were measured with binary self-report questions and this has important limitations. For instance, individuals at the point of referral may endorse more items as a way of eliciting help sooner, and so the data are not protected from bias. Furthermore, BPD questions such as “Have you suddenly changed your sense of who you are and where you are headed?” may be endorsed by individuals with PTSD referring to immediate change after their index event. An experienced clinician could unpick whether this was a regular feature of rapid identity disturbance or a natural response following a traumatic event. Previous studies have demonstrated self-reported BPD symptoms to have high test-retest reliability and comparable

to clinical interview however with some elevated criterion endorsement (Hurt, Hyler, Frances, Clarkin, & Brent, 1984; Hopwood et al., 2008) and this may have affected data from this self-reporting treatment-seeking group. Furthermore, personality disorders by their nature are characterised as developing since late adolescence, distinguishing BPD from PTSD or CPTSD that can have an onset at any point in life. A limitation of the present study is the lack of measurement of the age of onset for these symptoms. This would have been highly informative for distinguishing the presentations highlights a need for longitudinal research to assess the relationship between these domains. It would also be important to note that our analysis interprets the LCA results as representing different types of presentations, however it could theoretically be argued that the results represent simply different degrees of severity. This alternative interpretation would imply that earlier and multiple forms of interpersonal trauma leads to more severe psychopathology across the domains, rather than leading to Complex PTSD or BPD presentations specifically. The differences observed between the classes on specific variables, qualitative as well as quantitative, indicates qualitatively unique presentations, however this will need to be investigated in further studies designed to do so.

The research on CPTSD is in its infancy, and our understanding of the phenomenological interface with other mental health disorders will require high research input. This present study has highlighted factors that will hopefully facilitate this process. Firstly, it is important for researchers to use standardized tools in order to be able to compare findings with different samples. Secondly, there is clearly a difference between studies on traits in community populations and the presentation of those referred to specialist trauma clinics. Research that can build on each of these two areas will be important, using clinician-administered scales in order to avoid biased responding and increase sensitive differentiation between features in particularly the disturbed sense of self, impulsivity, and temper outbursts. Thirdly, research so far has tended to focus on female survivors of sexual abuse, and so

greater efforts to represent male survivors of a wide range of traumatic experiences, interpersonal and non-interpersonal, and accurately logging the age, frequency and severity of exposure will help to shed light on these matters. Although the current study included nearly equal numbers of males and females, the overall sample size was not large enough to reliably investigate the similarities and differences between these two subgroups. Finally, longitudinal studies that measure BPD symptoms in large samples that can capture the impact on emotional regulation, interpersonal difficulties, and self-concept pre- and post-trauma exposure and/or treatment would be invaluable in understanding how traumatic events impact upon these different presentations, and allow us to develop more refined interventions for this highly affected group.

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