**This is the final version of the manuscript accepted for publication in Psychological Trauma: Theory, Research, Practice, and Policy. The published article can be found here: doi: http://dx.doi.org/10.1037/tra0000114**

**An Assessment of the Construct Validity of the ICD-11 Proposal for Complex Posttraumatic Stress Disorder**

Philip Hyland1, Mark Shevlin2, Ask Elklit3, Jamie Murphy2, Frédérique Vallières4, Donn W. Garvert5, & Marylène Cloitre5,6

1National College of Ireland, Dublin, Ireland.

2Psychology Research Institute, School of Psychology, Ulster University, Londonderry, United Kingdom.

3 National Centre for Psychotraumatology, Institute for Psychology, University of Southern Denmark.

4Centre for Global Health, School of Psychology, Trinity College Dublin, Ireland

5National Center for PTSD Division of Dissemination and Training, Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA, USA.

6Department of Psychiatry and of Child and Adolescent Psychiatry, NYU Langone Medical Center, New York, NY, USA.

**Disclaimer**: Marylène Cloitre participated as a member of the World Health Organization Working Group on the Classification of Disorders Specifically Associated with Stress, reporting to the International Advisory Group for the Revision of ICD-10 Mental and Behavioural Disorders. Except as specifically indicated, the views expressed in this article do not represent the official positions of the Advisory Group or of the World Health Organization.

**Corresponding Author**: Philip Hyland, School of Business, National College of Ireland, IFSC, Mayor Street, Dublin 1, Ireland. Email: [Philip.hyland@ncirl.ie](mailto:Philip.hyland@ncirl.ie). Phone: 003531-4498696.

**Abstract**

***Background***: A new diagnosis, Complex Posttraumatic Stress Disorder (CPTSD), is set to be introduced in the 11th revision to the *International Classification of Diseases* (ICD-11). Studies have supported a unique group of trauma-exposed individuals who exhibit symptoms consistent with CPTSD proposals. No studies have yet tested the proposed latent symptom structure of CPTSD proposed for ICD-11. This study tests the factorial validity of CPTSD and assesses the role of a range of risk-factors to predict CPTSD.

***Methods***: A large sample (*N = 453*) of treatment-seeking adult victims of childhood sexual abuse completed self-report measures of CPTSD. Confirmatory factor analysis (CFA) was used to compare a set of alternative factor models of CPTSD.

***Results***: Just less than half of the sample met the diagnostic criteria for CPTSD (42.8%). CFA results supported the factorial validity of the ICD-11 proposals for CPTSD. Being female, and experiencing a greater number of sexual abuse acts during childhood were more strongly associated with PTSD than CPTSD symptoms. Regarding symptoms, anxiety was more strongly associated with PTSD than CPTSD whereas higher levels of dysthymia were more strongly associated with CPTSD than PTSD symptoms.

***Conclusions***: Results provide initial evidence regarding the factorial validity of the proposed ICD-11 model of CPTSD. In addition, current results support the proposals of the ICD-11 that exposure to abuse during early development is associated with a greater likelihood of CPTSD than PTSD. The study contributes to a growing body of empirical data supporting the construct validity of CPTSD as a unique diagnostic entity.

***Introduction***

The World Health Organization (WHO) is due to release the 11th revision of the *International Classification of Diseases* (ICD-11) in 2017. The working group for ‘disorders associated with stress’ have put forth a very different method of conceptualising stress-related psychiatric disorders from what is currently presented by the American Psychiatric Association (APA) in the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5: APA, 2013) (see Maecker et al., 2013). While DSM-5 expanded the symptom profile of posttraumatic stress disorder (PTSD) to include 20 symptoms, the ICD-11 proposes two ‘sibling disorders’ posttraumatic stress disorder (PTSD) and complex posttraumatic stress disorder (CPTSD).

WHO emphasized clinical utility as the organizing principle in classification development, which includes characteristics such that diagnoses should be consistent with clinician’s mental health taxonomies, limited in number of symptoms and based on distinctions important for management and treatment (Reed, 2010). These recommendations guided the organization of PTSD and CPTSD and their relationship to each other. These two disorders have distinct but related conceptual frames that organize the symptom picture with a streamlined number of symptoms.

ICD-11 PTSD is defined by three groups of symptoms: (1) re-experiencing of the trauma in the present (RE: 2 symptoms), (2) avoidance of traumatic reminders (AV: 2 symptoms), and (3) a persistent sense of threat that is manifested by increased arousal and hypervigilance (SOT: 2 symptoms). The symptoms of PTSD represent a fear response with its focus on re-experiencing of the traumatic memory and consequent avoidance and hypervigilance. In contrast, the symptom profile of CPTSD includes the core PTSD symptoms plus an additional 6 symptoms that identify ‘disturbances in self-organization’ (DSO) which may result from sustained, repeated and multiple forms of traumatic exposures. There are three DSO symptom categories: (1) affective dysregulation (AD: 2 symptoms), (2) negative self-concept (NSC: 2 symptoms), and (3) interpersonal problems (IP: 2 symptoms). The conceptualization of complex PTSD which was first described by Herman (1992) and has been further elaborated more recently (Courtois & Ford, 2014; Ford, 2015) has consistently included the above three domains of disturbance. The selection of the specific types of symptoms within the ICD-11 was guided by the symptoms most frequently reported by participants in the DSM-IV field trials assessing complex PTSD (see Van der Kolk, Roth, Pelcovitz, Sunday, & Spinazolla, 2005) as well as those identified as the most frequent and most impairing by expert clinicians in a recent consensus survey on complex PTSD (Cloitre, Courtois, Charuvastra, Carapezza, Stolbach, & Green, 2011).

A diagnosis of PTSD requires the presence of at least one symptom from each of the three categories (RE, AV, and SOT), while a diagnosis of CPTSD requires the presence of at least one symptom from each of the three PTSD symptom categories along with at least one symptom from each of the three DSO symptom categories (AD, NSC, and IP). Whereas the PTSD symptoms are related to trauma-relevant stimuli, the DSO symptoms concern negative alterations that are pervasive and occur across a variety of contexts and relationships. In addition, the ICD-11 specifies that the nature of the trauma history does not determine which diagnosis is appropriate, however it does suggest that exposure to repeated traumas, and especially those that begin early in development, are associated with greater risk of a CPTSD versus a PTSD diagnosis (Cloitre, Garvert, Brewin, Bryant, & Maecker, 2013; Maerker et al, 2013).

Since the publication of the proposals for the CPTSD diagnosis in ICD-11 a number of investigators have sought to assess the validity of this diagnostic category. Several studies using latent class analysis (LCA) and latent profile analysis (LPA) have identified unique classes of trauma survivors whose symptom profiles reflect the distinction between PTSD and CPTSD (Cloitre et al., 2013; Cloitre, Garvert, Weiss, Carlson, & Bryant, 2014; Elklit, Hyland, & Shevlin, 2014; Knefel, Garvert, Cloitre, & Lueger-Schuster, 2015; Perkonigg, Hofler, Cloitre, Wittchen, Trautmann, & Maercker, 2015). Moreover, these studies have shown that trauma-survivors who exhibit CPTSD symptoms are distinguishable from those with borderline personality disorder (Cloitre et al., 2014). Of the seven trauma samples included in these studies, PTSD class membership was more common within four samples (female rape victims, bereaved parents, physical assault victims (Elklit et al., 2014), and a representative community sample of the German population aged 14-24 years (Perkonigg et al., 2015)), whereas PTSD and CPTSD class membership were equally common in three of the samples (a sample with heterogeneous types of trauma exposures (Cloitre et al., 2013); female child abuse victims (Cloitre et al, 2014); and survivors of institutional abuse (Knefel et al., 2015)).

This line of research also sought to identify risk-factors for CPTSD class membership. Female gender (Knefel & Lueger-Schuster, 2013; Knefel et al., 2015) and increased levels of psychological distress, comorbid mental disorders, and functional impairment (Cloitre et al., 2013; Elklit et al., 2014; Perkonigg et al., 2015) have been found to be associated with an increased likelihood of displaying CPTSD symptoms following traumatic exposure. Findings related to the role of trauma history variables (e.g., the type of trauma experienced, the chronicity of the trauma, and the number of traumatic exposures) as risk-factors for CPTSD has been mixed. While some studies have found a positive association between chronic traumatic exposure and CPTSD class membership (Cloitre et al., 2013; Knefel & Lueger-Schuster, 2013), other studies have found no such relationship (Wolf et al., 2015). While some studies have not found sociodemographic factors such as age, minority status, ethnicity and employment status associated with CPTSD (Cloitre et al., 2014; Wolf et al., 2015), at least one study reported that lower educational attainment and lower socioeconomic status was a correlate of CPTSD (Perkonigg et al., 2015).

Despite the empirical support obtained from the existing LCA and LPA studies for the validity of a unique diagnostic structure of CPTSD, there has been little empirical assessment of the validity of the proposed symptom structure of CPTSD. Cloitre et al. (2013) and Knefel and Lueger-Schuster (2013) used confirmatory factor analysis to assess a model of CPTSD that included four latent variables (PTSD, AD, NCS, and IP). In both studies the model fit the respective data very well. However, careful attention to the conceptualization of the ICD-11 proposal of PTSD and CPTSD being “sibling” diagnoses would suggest that there are six first-order latent factors (RE, AV, SOT, AD, NSC, and IP) and two correlated higher-order factors (PTSD and DSO). Specifically, it would be expected that the PTSD higher-order latent construct would explain the covariation between the RE, AV, and SOT factors, while the DSO higher-order latent construct would explain the covariation between the AD, NSC, and IP factors (see Figure 1).

The primary objective of the current study was to test whether such a model accurately represented the latent structure of the 12 ICD-11 CPTSD symptoms within an alternative models framework using CFA procedures. The secondary objective of the current study was to assess the differential effects of a range of possible risk-factors (gender, age of onset of abuse, history of being abused by more than one person, number of sexual abuse acts experienced during childhood, duration of abuse in years as well as symptoms of anxiety and dysthymia) associated with PTSD and DSO symptomology.

**Methods**

*Participants and Procedures*

Participants were all victims of childhood sexual abuse (CSA: *N = 453*) that attended four different Danish treatment centres for victims of CSA. The majority of participants were women (86%) and all were Caucasian. All attendees presented with distress and impairment resulting from their traumatic abuse history and received individual psychotherapy of an eclectic nature that suited their needs. The mean age of the sample was 36.07 years (SD = 10.41; range 18-70). Almost all (91%) had experienced CSA before the age of 15 committed by a person at least five years older than them and on an average of 23.47 years ago (SD = 12.30). The mean age for CSA onset was 7.12 years (SD = 4.03), and the average age at which the abuse ended was 13.54 years (SD = 4.42). The average duration of abuse was 7.11 years (SD = 6.56) and the mean number of sexual abuse acts experienced in childhood was 3.38 (SD = 1.31).

*Measures*

Two measures, the Harvard Trauma Questionnaire Part IV (HTQ-IV: Mollica et al., 1992), and the Trauma Symptom Checklist (TSC: Briere & Runtz, 1989) were used to represent symptom profiles consistent with the ICD-11 model of CPTSD (see Table 1). Both measures used a four-point Likert response scale. The TSC asks participants to rate the frequency of occurrence (“*How often have you experienced each of the following in the last month?*”) of each symptom (1 = ‘never’, 2 = ‘yes, sometimes’, 3 = ‘yes, often’, 4 = ‘yes, very often’). The HTQ asks participants to rate the distress each symptom has caused them in the previous week (“*Decide how much the symptoms bothered you in the last week*.”) on a scale (1 = ‘not at all’, 2 = ‘a little’, 3 = ‘quite a bit’, 4 = ‘all the time’). Seven items from the HTQ and five items from the TSC were used to develop the CPTSD item set (see Table 1). Cronbach’s alpha for the twelve items was .79.

Anxiety and dysthymia levels were measured using the Millon Clinical Multiaxial Inventory-III (MCMI-III: Millon, Millon, Davis, & Grossman, 2009). The MCMI-III is a self-report psychological assessment tool intended to provide information on psychopathology, including specific disorders outlined in the DSM-IV (APA, 1994). It is intended for adults (18 and over) with at least an 8th grade reading level who are currently seeking mental health services. The MCMI was developed and standardized specifically on clinical populations. The MCMI-III was translated into Danish (Simonsen & Elklit, 2008) and Elklit (2004) demonstrated the discriminative validity of the Danish MCMI-III in the analyses of a number of patient groups. Scale intercorrelations were very much alike across the Danish and the US samples, and the range of Cronbach’s alpha values of the MCM-III scales (.64–.93) of the Danish sample was comparable to the range of values (.66–.95) in the MCMI-III manual (Millon et al., 2009). Standardized base rate (BR) scores for anxiety and dysthymia that can range from 0 to 115 were used in the current analyses.

*Statistical Analyses*

*Confirmatory Factor Analysis (CFA)*

CFA was used to compare the fit a number of potential latent models of the symptom structure of ICD-11 CPTSD (see Figure 1). Model 1 is a unidimensional structure in which the 12 CPTSD indicators load onto a single latent variable. Model 2 is a correlated two-factor model in which 6 items reflecting ICD-11 PTSD load onto one latent factor (PTSD), and 6 items reflecting DSO load onto the other latent factor (DSO). Model 3 is correlated six-factor model where two items load onto 6 latent factors; re-experiencing, avoidance, sense of threat, affective dysregulation, negative self-concepts, and interpersonal problems. Model 4 is a higher-order variant of Model 3 in which the covariation between the re-experiencing, avoidance, and sense of threat factors are explained by one higher-order latent factor (‘PTSD’), and the covariation between the factors of affective dysregulation, negative self-concepts, and interpersonal problems are explained by another higher-order latent factor (‘DSO’). Model 4 can be said to best reflect the structure of CPTSD proposed by the ICD-11.

[Insert Figure 1 Here]

*Testing Differential Effects of Predictors*

Following the identification of the best fitting model of ICD-11 CPTSD, a range of predictors were added to the model to assess their differential predictive effects on the identified latent variables. Seven predictors were added to the CFA model. One related to sociodemographics: gender (0 – male, 1 – female); four related to trauma history: age of onset of abuse, a history of being abused by more than one person (0 – no, 1 – yes), number of sexual abuse acts experienced in childhood (0 – 1-5 sexual abuse acts experienced, 1 – 6 or more sexual abuse acts experienced), duration of the abuse (measured in years); and two were related to current symptoms: MCMI BR scores of anxiety and dysthymia. Testing differential predictive effects proceeds in a sequential fashion. The predictors were first entered into the model with the best CFA solution and each factor was regressed onto each predictor with the regression coefficients constrained to be equal. This general model is depicted in Figure 2.

[Insert Figure 2 Here]

In Figure 2 it can be seen that the regression coefficients for Age of onset of abuse predicting Factor 1 is constrained to be equal to the regression coefficients for Age predicting Factor 2. These equality constraints were imposed on all the predictors. This model tests the hypothesis that the predictors do not differentially predict the outcome factors. Once this model has been estimated the equality constraints can be sequentially relaxed based on the modification indices (MI) for the constrained parameters. If the MI for a constrained parameter was greater than 3.84 (the critical value for 1 degree of freedom for the chi-square distribution) the equality constraint was removed and the two paths were estimated separately as this would significantly improve the overall fit of the model. This process of relaxing equality constraints continues until there are no MI’s greater than 3.84.

All analyses were conducted using Mplus version 7.11 (Muthén & Muthén, 1998-2013) with robust maximum likelihood estimation (Yuan & Bentler, 2000). This method allowed parameters to be estimated using all available information and has been found to be superior to alternative methods such as listwise deletion (Schafer & Graham, 2002). Furthermore, the MLR estimator is robust to non-normally distributed data and can produce corrected standard errors under conditions of non-normality (Enders, 2001). Standard recommendations were followed to determine model fit (Klein, 2011). Good model fit was indicated by a chi-square (χ2) to degree of freedom ratio of less than 3:1; Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) values above .90 reflect acceptable model fit, and values above .95 reflect excellent model fit; Root-Mean-Square Error of Approximation with 90% confidence intervals (RMSEA 90% CI) and Standardized Root-Mean-Square Residual (SRMR) values of .05 or less reflect excellent model fit, while values less than .08 reflect acceptable model fit. Furthermore, the Bayesian Information Criterion (BIC) was used to evaluate alternative nested and non-nested models, with the smallest value indicating the best fitting model. A ten point difference between two BIC values is suggested to represent strong evidence (odds ratio 150:1) that the model with the lower value is superior (Raferty, 1995). The CFI, RMSEA, and BIC all have explicit penalties for model complexity.

**Results**

*Prevalence Rates*

Among the current sample of CSA victims, 50.6% (n = 229) endorsed the symptom clusters of re-experiencing, avoidance and sense of threat. Following the ICD-11 binary diagnostic categorization into either PTSD (PTSD alone) or CPTSD (PTSD plus DSO), 7.8% met criteria for PTSD and 42.8% (n = 194) met criteria for CPTSD. This result indicates that rates of CPTSD were higher than for PTSD (z = 12.15, p < .0001).

*CFA Results*

The fit indices for the alternative CPTSD models are presented in Table 2. The unidimensional model and the two-factor model of CPTSD were both rejected as poor approximations of the data. The correlated six-factor model, and the higher-order model of CPTSD exhibited similar fit statistics. For both models the χ2-to-degree of freedom ratios were less than 3:1, and the SRMR values were .05 or below, indicating that both models fit the data very well. Additionally, the CFI and RMSEA values for both models were indicative of adequate model fit. The only fit index that was not of an acceptable standard in both cases was the TLI. Overall, the model fit statistics suggest that the six-factor model and the higher-order model both provided an adequate representation of the data obtained from this sample of CSA survivors. However, the BIC value was lower for the higher-order model suggesting its statistical superiority. The higher-order model has fewer model parameters and is therefore more parsimonious. On basis of parsimony and theoretical consistency the higher-order model was judged to be the best model.

[Insert Table 2 Here]

Factor loadings for the higher-order model are reported in Table 3. All symptom indicators loaded onto their respective first-order latent factors in an expected manner with the loadings being positive, high (> .40 in all cases), and statistically significantly (p < .001). Moreover, the re-experiencing, avoidance, and sense of threat factors all loaded strongly onto the ‘PTSD’ higher-order factor. Likewise, the affective dysregulation, negative self-concept, and interpersonal problems factors loaded strongly onto the ‘DSO’ higher-order factor. The PTSD and DSO factors were strongly correlated (r = .81, p < .001).

[Insert Table 3 here]

Following the selection of the higher-order model structure of the 12 CPTSD symptoms, the seven predictors were added to the model. In the first step of the analysis the paths from each of the predictors to the PTSD and DSO factors were constrained equal (BIC = 26,498). Inspection of the MI values revealed that the largest reduction in the value of the χ2 for the model would result from freeing the paths from anxiety to the two factors. This resulted in an improvement in the overall model (BIC = 26,477). MI results then indicated further improvement in the model by freeing the paths for gender (BIC = 26,462). MI results again suggested that the model could be improved by freely estimating the paths from the predictor ‘number of abuse acts’ to the two factors (BIC = 26,459). MI values suggested a further slight improvement by freely estimating the paths for dysthymia (BIC = 26,460). No further improvements in the model were indicated at this point. These results indicate that anxiety, gender, number of abuse acts, and dysthymia have significantly different predictive effects on PTSD symptoms and DSO symptoms.

Table 4 reports in detail the path coefficients for the seven predictor on the PTSD and DSO factors. Age of onset of abuse, history of being abused by more than one person, and the duration of the abuse were not related to PTSD or DSO. Female gender was a weak predictor of PTSD (β = .30) and DSO (β = .16) symptoms. Experiencing six or more abuse acts was a weak predictor of PTSD symptoms (β = .16) and was not associated with DSO symptoms. Increased levels of anxiety was a moderately strong predictor of PTSD symptoms (β = .51), and a weak predictor of DSO symptoms (β = .15). The opposite effect was observed for dysthymia symptoms which was a strong predictor of DSO symptomology (β = .66) but a weak predictor of PTSD symptomology (β = .28). These results indicate that being female, and experiencing a greater number of sexual abuse acts during childhood are more strongly associated with PTSD symptomology than DSO symptomology. Regarding symptoms, anxiety were strongly associated with PTSD symptoms but not with DSO symptoms while higher levels of dysthymia are more strongly associated with DSO symptoms than PTSD symptoms. Overall, the seven covariates explained 59% of variance in PTSD symptomology, and 56% of variance in DSO symptomology.

[Insert Table 4 Here]

**Discussion**

With the release of ICD-11 by the WHO in 2017 the diagnostic nomenclature will include for the first time a diagnosis of CPTSD. Clinicians working with trauma-exposed patients will therefore be faced with the challenge of deciding which trauma-related diagnosis may be more appropriate for a given patient: PTSD or CPTSD. Given the importance of the introduction of CPTSD to the diagnostic literature for both researchers and clinicians, this study was developed in order to provide the first assessment of the proposed latent symptom structure of CPTSD.

Following ICD-11 criteria for differential diagnosis of PTSD versus CPTSD, and based on self-report instruments, 42.8% of the current sample met the symptom criteria for CPTSD and 7.8% of the sample met criteria for PTSD. This increased prevalence of CPTSD compared to PTSD in the current sample is consistent with the theoretical basis of CPTSD that exposure to severe trauma during early development increases the likelihood of a CPTSD rather than a PTSD diagnosis (Cloitre et al., 2013; Maercker et al., 2013). Furthermore, among a number of plausible models that could explain the latent structure of the 12 CPTSD symptoms, strongest support was found for the model consistent with ICD-11 proposals for CPTSD. As the ICD-11 states that PTSD and CPTSD are ‘sibling disorders’ we proposed the presence of two higher-order correlated latent factors (PTSD and DSO) which explain the covariation between the six, first-order latent factors (RE, AV, SOT, AD, NSC, and IP). The fit of this model to the data was considered acceptable based on established criteria for assessment of model fit (Klein, 2011). Although the higher-order CPTSD model was deemed to provide the best fit of the data based on the ground of parsimony and theoretical consistency, it should be noted that the correlated six-factor model produced very similar fit statistics. While less parsimonious than the higher-order model favoured in this study, this factor structure should be considered as a plausible alternative in future assessments.

Following the identification of the appropriate latent structure of ICD-11 CPTSD, a second objective of the current study was to assess if the demographic (gender), trauma-history (age of onset of abuse, number of abusers, number of sexual abuse acts experienced, and duration of abuse), and psychological (anxiety and dysthymia) risk-factors could differentially predict PTSD and DSO symptomology. Through a sequential process of model testing we found that gender, number of sexual abuse acts experienced in childhood, anxiety, and dysthymia possessed significantly different effects on PTSD symptomology and DSO symptomology. Being female had significantly stronger effects on PTSD symptoms than on DSO symptoms while having experienced six of more sexual abuse acts in childhood predicted greater levels of PTSD symptomology but not DSO symptoms. Higher levels of anxiety were strongly predictive of higher PTSD symptoms, but only weakly predictive of higher DSO symptoms. In contrast, dysthymia strongly predicted increased levels of DSO symptoms and weakly predicted increased levels of PTSD symptoms.

Current results which found that anxiety was more strongly related to symptoms of PTSD than DSO, and that dysthymia was more strongly related to the DSO than PTSD symptoms is consistent with the conceptual distinction between ICD-11 PTSD and CPTSD. ICD-11 PTSD has been conceptualized as fear condition with a focus on the re-experiencing of the traumatic memory and consequent avoidance and hypervigilance where the emotions of fear and horror are central (Cloitre et al., 2013). In contrast, Complex PTSD highlights a diminished sense of self (i.e., worthlessness) and impoverished capacity for sustained interpersonal connections, both of which might well be associated with dysthymia. That anxiety is associated with constellation of symptoms driven by sense of threat and while dysthymia is associated with symptoms representing a sense of defeat and social disengagement provide support for the validity of the ICD proposals for PTSD and CPTSD.

Female gender has previously been shown to be more strongly associated with CPTSD than PTSD (Knefel & Lueger-Schuster, 2013), and although in the current study female gender predicted increased DSO symptoms, we found that female gender was a stronger predictor of PTSD symptomology than DSO symptomology. In addition, having experienced six or more sexual abuse experiences in childhood was found to increase the likelihood of PTSD symptomology but not DSO symptomology. There are several reasons for these potentially unexpected findings. First, while it was expected that childhood abuse would yield a relatively high rate of CPTSD, the salience of the PTSD symptoms among women may be the result of recent adulthood sexual assault or domestic violence among women, a frequent consequence of childhood abuse among women (Cloitre, Tardiff, Marzuk, Leon, & Portera, 1996) but one which does not appear to be commonly occurring among men (Cloitre, Tardiff, Marzuk, Leon, & Portera, 2001). In addition, number of different *types* of childhood abuse experiences (e.g., physical abuse, sexual abuse, neglect) has been found to be associated with complex PTSD symptoms and not necessarily number of instances of abuse (Briere et al., 2008; Cloitre et al., 2009). It is possible that repeated instances of the same traumatic stressor increases fear response while exposure to multiple types of traumatic stressors leads to greater complexity in symptom presentation. Unfortunately, information about the occurrence of other types of traumatic events was not available in this data set.

The current findings have a number of important implications for both theory and research. The present study systematically evaluated the latent symptom structure of the proposed ICD-11 model of CPTSD with results indicating satisfactory model fit. In addition to the numerous other findings regarding the validity of a unique and distinguishable class of trauma survivors who exhibit the symptom profile of CPTSD (Cloitre et al., 2013; Cloitre et al., 2014; Elklit et al., 2014; Knefel & Lueger-Schuster, 2013; Knefel et al., 2015), researchers and clinicians now have a growing body of evidence, drawn from a multitude of distinct trauma populations, to support the construct validity of CPTSD as a distinct diagnostic entity. Furthermore, the current study has provided considerable support for the fundament proposition of the ICD-11 proposals that exposure to childhood trauma increases the likelihood of a CPTSD diagnosis in adulthood, rather than a PTSD diagnosis. This result should highlight to both researchers and clinicians the importance of screening for CPTSD when working with individuals who were exposed to trauma during their early development. The current study has additionally supported the discriminant validity of the PTSD and CPTSD diagnoses as we demonstrated distinct relationships for anxiety and dysthymia with PTSD and DSO symptomology. The recognition of a unique CPTSD disorder may require alternative clinical interventions to the standard evidence-based methods of treating PTSD (Ford, 2015). Multiphase therapeutic interventions have been developed for both adult (Cloitre et al., 2011) and child (Conner Ford, Arnsten, & Greene, 2014) CPTSD populations and should be considered by clinicians when working with victims with CPTSD.

The current data set did not include a measure of dissociation. The relationship of dissociation to ICD-11 PTSD as compared to Complex PTSD remains unknown. Dissociation has frequently been characterized as an adaptive response to overwhelming affect such as fear or horror (e.g., Briere, 1992). In this formulation, dissociation would more likely fit as part of a PTSD profile rather than a Complex PTSD profile which emphasizes the presence of chronic, sustained and multiple types of traumatic exposures. Analyses that test the differential strength of association of dissociation as a covariate to ICD-11 PTSD versus CPTSD, such as was conducted in this study with anxiety and dysthymia, would be of value. In addition, the DSM-5 has a dissociative subtype comprised of two symptoms (derealisation and depersonalization) and a future study of interest, given a data set with a sufficiently large and diverse trauma population and all of the relevant symptom variables, would be a comparison of the DSM-5 PTSD dissociative subtype to ICD-11 CPTSD.

Despite the strengths of the current study there are a number of limitations which should be noted. First, the current study did not use a specific ICD-11 based measure of CPTSD therefore prevalence estimates and model-fit may be affected. However, these results encourage the development of such measures. Replication with a specific ICD-11 CTPSD measure is essential. Second, the current study was based on a sample comprised entirely of Danish victims of CSA therefore it is unknown whether current findings are generalizable to other cultural populations or other trauma groups. Likewise, the sample was predominately female therefore future work will need to replicate this study with a more appropriately gender balanced sample. Third, previous studies have shown that the number of different types of trauma experienced in childhood is the strongest predictor of CPTSD (Cloitre et al., 2009) however in the current study we were unable to determine if the participants in the sample had experienced other traumas in addition to their sexual abuse. Given the importance of this variable in the prediction of CPTSD, future research efforts should strive to measure the entire range of traumatic experiences faced during both childhood and adulthood. Finally, we found strong support for the association between early developmental traumatic exposure and likelihood of a CPTSD diagnosis rather than a PTSD diagnosis. Future studies are necessary which investigate diverse trauma populations, such as adults who have experienced domestic violence or who are refugees and have experienced sustained interpersonal violence to test the more general hypothesis that exposure to chronic, sustained and multiple types of trauma is associated with the CPTSD diagnosis.

**References**

American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4thed.* Washington DC: American Psychiatric Association.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5thed.* Washington DC: American Psychiatric Association.

Bach, M. (2003). En empirisk belysning og analyse af “Emotionel Numbing” som eventuel selvstændig faktor i PTSD. [An empirical illumination and analysis of emotional numbing as an independent factor in PTSD]. *Psykologisk studieskriftserie, 6*, 1-199.

Briere, J. (1992). *Child Abuse Trauma: Theory and Treatment of the Lasting Effects .*Newbury Park, CA: Sage Publications.

Briere, J., & Runtz, M. (1989). Trauma Symptom Checklist (TSC-33). *Journal of Interpersonal Violence, 4*, 151-163.

Briere, J., Kaltman, S., & Green, B. L. (2008). Accumulated childhood trauma and symptom complexity. *Journal of Traumatic Stress*, *21*, 223–226. [http://dx.doi.or](http://dx.doi.or/)[g/10.1002/jts.20317](http://dx.doi.org/10.1002/jts.20317)

Cloitre M., Tardiff, K., Marzuk, P., Leon, A.C., Portera, L. (1996). Child abuse and subsequent sexual victimization among female inpatients. *Journal of Traumatic Stress*, 9, 473-482.

Cloitre M., Tardiff, K., Marzuk, P., Leon, A.C., Portera L. (2001). The consequences of childhood abuse among male psychiatric patients: Dual roles as victims & perpetrators. *Journal of Traumatic Stress,* 14, 47-61.

Cloitre, M., Courtois, C. A., Charuvastra, A., Carapezza, R., Stolbach, B. C., & Green, B. L. (2011). Treatment of complex PTSD: Results of the ISTSS expert clinician survey on best practices. *Journal of Traumatic Stress, 24*, 615-627. doi: 10.1002/jts.20697.

Cloitre, M., Garvert, D. W., Brewin, C. R, Bryant, R. A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: a latent profile analysis. *European Journal of Psychotraumatology, 4,* 20706*.* doi: 10.3402/ejpt.v4i0.20706

Cloitre, M., Garvert, D.W., Weiss, B., Carlson, E. B., & Bryant, R. A. (2014). Distinguishing PTSD, Complex PTSD, and Borderline Personality Disorder: A latent class analysis. *European Journal of Psychotraumatology, 5*. doi: [10.3402/ejpt.v5.25097](http://dx.doi.org/10.3402/ejpt.v5.25097)

Cloitre, M., Stolbach, B.C., Herman, J.L., van der Kolk, B., Pynoos, R., Wang, J., et al. (2009). A developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress*, *22*, 399–408. <http://dx.doi.org/>[10.1002/jts.20444](http://dx.doi.org/10.1002/jts.20444).

Courtois, C. A., & Ford, J. D. (Eds.). (2014). *Treating complex traumatic stress disorders: scientific foundations and therapeutic models*. Guilford Press.

Connor, D. F., Ford, J. D., Arnsten, A. F., & Greene, C. A. (2014). An update on posttraumatic stress disorder in children and adolescents. *Clinical Pediatrics*. doi: 10.1177/0009922814540793.

Elklit, A. (1990). Ma°ling af belastninger efter voldeligt overfald med TSC-33 (traume symptom checkliste). [Measuring distress after violent assault with TSC-33]. *Nordisk Psykologi, 42*, 281-289.

Elklit, A. (2004). [En afprøvning af MCMI-III på et dansk patientmateriale](http://pure.au.dk/portal/en/publications/en-afproevning-af-mcmiiii-paa-et-dansk-patientmateriale(c7f7fca0-6d9e-11db-bee9-02004c4f4f50).html). In A. Elklit, & E. Simonsen (Eds.), *En introduktion til Millon Clinical Multiaxial Inventory.* (2. ed., pp. 73-110). København: Dansk Psykologisk Forlag.

Elklit, A., Hyland, P., & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology* 5*:* 24221. doi:10.3402/ejpt.v5.24221

Enders, C. K. (2001). A primer on maximum likelihood algorithms available for use with missing data. *Structural Equation Modeling, 8*, 128-141.

Ford, J. D. (2015). Complex PTSD: research directions for nosology/assessment, treatment, and public health. *European Journal of Psychotraumatology, 6*: 27584. Doi: <http://dx.doi.org/10.3402/ejpt.v6.27584>

Herman, J. L. (1992). *Trauma and reco*v*ery: The aftermath of* v*iolence from domestic* v*iolence to political terrorism*. New York, NY: Guilford Press.

Kline, R.B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). Guilford, New York.

Knefel, M., & Lueger-Schuster, B. (2013). An evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse. *European Journal of Psychotraumatology, 4*, 22608, doi: <http://dx.doi.org/10.3402/ejpt.v4i0.22608>

Knefel, M., Garvert, D. W., Cloitre, M., & Lueger-Schuster, B. (2015). Update to an evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse by Knefel & Lueger-Schuster (2013): a latent profile analysis. *European Journal of Psychotraumatology, 6,* 25290. doi: http://dx.doi.org/10.3402/ejpt.v6.25290

Maercker, A., Brewin, C. R, Bryant, R. A., [Cloitre, M](http://www.ncbi.nlm.nih.gov/pubmed?term=Cloitre%20M%5BAuthor%5D&cauthor=true&cauthor_uid=23583019)., [Reed, G. M](http://www.ncbi.nlm.nih.gov/pubmed?term=Reed%20GM%5BAuthor%5D&cauthor=true&cauthor_uid=23583019)., [van Ommeren, M](http://www.ncbi.nlm.nih.gov/pubmed?term=van%20Ommeren%20M%5BAuthor%5D&cauthor=true&cauthor_uid=23583019).,…, & Saxena, S. (2013). Proposals for mental disorders specifically associated with stress in the ICD-11. *Lancet, 381*, 1683-1685. doi: 10.1016/S0140-6736

Millon, T., Millon, C., Davis, R., & Grossman, S. (2009). *MCMI-III manual* (4th ed.). Minneapolis, MN: Pearson Education.

Mollica, R. F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). Harvard Trauma Questionnaire. *Journal of Nervous and Mental Disease, 180*,111-116. doi: 10.1177/0020764007078362

Muthén, L. K., & Muthén, B. O. (1998–2013). *MPlus user’s guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Perkonigg, A., Hofler, M., Cloitre, M., Wittchen, H. U., Trautmann, S., & Maercker, A. (2015). Evidence for two different ICD-11 posttraumatic stress disorder in a community sample of adolescents and young adults. *European Archives of Psychiatry and Clinical Neuroscience.* DOI 10.1007/s00406-015-0639-4

Raftery, A. E. (1995). Bayesian Model Selection in Social Research. *Sociological Methodology, 25*, 111-163.

Reed, GM. (2010) Toward ICD-11: Improving the clinical utility of WHO's international classification of mental disroders. *Professional Psychology: Research and Practice, 41*, 457-464.

Schafer, J. L., & Graham J. W. (2002). Missing data: our view of the state of the art. *Psychological Methods, 7*, 147-177. doi: 10.1037//1082-989X.7.2.147

Simonsen, E., & Elklit, A. (2008). Experiences in Translating and Validating the MCMI in Denmark. In Millon, T. & Bloom, c. (Eds.) *The Millon Inventories: A Practitioner´s Guide to Personalized Clinical Assessment. 2nd edition.* (pp 387-404). NY: Guilford Press.

Tay, A. K., Rees, S., Chen, J., Kareth, M., & Silove, D. (2015). The structure of post-traumatic stress disorder and complex post-traumatic stress disorder amongst West Papuan refugees. *BMC Psychiatry, 15*: 111. DOI 10.1186/s12888-015-0480-3

Wolf, E. J., Miller, M. W., Kilpatrick, D., Resnick, H. S., Badour, C. L., Marx, B. P., et al. (2015). ICD-11 Complex PTSD in US National and Veteran Samples: Prevalence and Structural Associations with PTSD. *Clinical Psychological Science, 3*, 215-229.

Van der Kolk, B. A., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress*, *18*, 389-399.

Yuan, K. H., & Bentler, P. M. (2000). Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociological Methodology, 30*, 165-200. doi:  10.1111/0081-1750.00078

Table 1. Items of the HTQ and the TSC used to represent the symptoms of PTSD and CPTSD according to ICD-11 guidelines.

|  |  |  |
| --- | --- | --- |
|  | Cluster | Test items |
| PTSD | Re-experiencing | HTQ 2. Feeling as though the event is happening again in the present (x1) |
|  |  | HTQ 3. Recurrent nightmares (x2) |
|  | Avoidance | HTQ 15. Avoiding thoughts or feelings associated with the traumatic or hurtful event (x3) |
|  |  | HTQ 11. Avoiding activities that remind you of the traumatic or hurtful event (x4) |
|  | Sense of threat | HTQ 9. Feeling on guard (x5) |
|  |  | HTQ 6. Being jumpy or easily startled (x6) |
| CPTSD | Affect dysregulation | TSC 16. Temper outburst that you could not control (x7) |
|  |
|  |  | TSC 14. Crying easily (x8) |
|  | Negative self-concept | TSC 28. Feelings of inferiority or insecurity (x9) |
|  |  | TSC 29. Blaming yourself (x10) |
|  | Interpersonal problems | TSC 6. Feeling isolated from other people (x11) |
|  |  | HTQ 27. Feeling that you have no one to rely upon (x12) |

Table 2. Fit indices for the alternative models of the symptom structure of CPTSD

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***χ2*** | ***df*** | **CFI** | **TLI** | **RMSEA (90% CI)** | **SRMR** | **BIC** |
| 1 Factor Model | 266.86\* | 54 | .77 | .72 | .09 (.08-.11) | .07 | 14874 |
| 2 Factor Model | 209.51\* | 53 | .83 | .79 | .08 (.07-.09) | .06 | 14816 |
| 6 Factor Model | 109.10\* | 39 | .93 | .87 | .06 (.05-.07) | .04 | 14793 |
| Higher-order Model | 143.79\* | 47 | .90 | .86 | .07 (.06-.08) | .05 | 14781 |

*Note.*  *N* = 453; χ2 = chi square goodness of fit statistic; \* indicates *χ2* is statisticallysignificant (*p* < .001); *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA (90% CI) = Root-Mean-Square Error of Approximation with 90% Confidence Intervals; SRMR = Standardized Square Root Mean Residual; BIC = Bayesian Information Criterion;

Table 3. Standardized factor loadings (standard errors) for the higher-order model of CPTSD

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Item | Re-experiencing | Avoidance | SOT | AD | NSC | IP |
| 1. Reliving event | .62 (.05) |  |  |  |  |  |
| 2. Recurrent dreams | .69 (.06) |  |  |  |  |  |
| 3. Avoiding thoughts |  | .59 (.06) |  |  |  |  |
| 4. Avoiding activities |  | .52 (.06) |  |  |  |  |
| 5. Hypervigilance |  |  | .54 (.05) |  |  |  |
| 6. Exaggerated Startle |  |  | .74 (.06) |  |  |  |
| 7. Temper outburst |  |  |  | .44 (.07) |  |  |
| 8. Crying easily |  |  |  | .42 (.07) |  |  |
| 9. Sense of inferiority |  |  |  |  | .66 (.05) |  |
| 10. Self-blame |  |  |  |  | .75 (.05) |  |
| 11. Feeling isolated |  |  |  |  |  | .61 (.04) |
| 12. No one to rely on |  |  |  |  |  | .76 (.04) |
| **Factors** |  |  | **PTSD** | **DSO** |  |  |
| Re-experiencing |  |  | .76 (.08) |  |  |  |
| Avoidance |  |  | .85 (.08) |  |  |  |
| SOT |  |  | .75 (.07) |  |  |  |
| AD |  |  |  | .78 (.11) |  |  |
| NSC |  |  |  | .81 (.05) |  |  |
| IP |  |  |  | .93 (.06) |  |  |

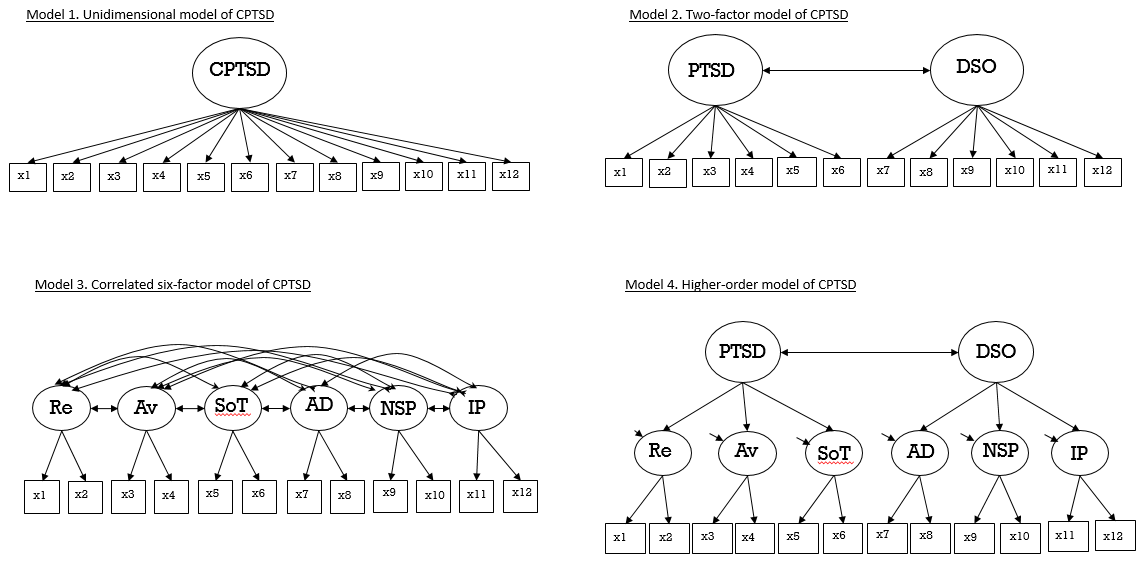
*Note.* All factor loadings are statistically significant (p < .001). SOT = sense of threat; AD = affective dysregulation; NSC = negative self-concept; IP = Interpersonal problems; PTSD = posttraumatic stress disorder; DSO = Disturbances in self-organization.

Table 4. Unstandardized (standard error) and standardized beta values for the predictors of symptoms of PTSD and DSO from the final stage of analysis.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **PTSD** |  |  |  | **DSO** |  |
| **Predictor variables** | **B (SE)** | **β** | **p** |  | **B (SE)** | **β** | **p** |
| Age of onset of abuse | .004 (.004) | .033 | .428 |  | .004 (.004) | .045 | .417 |
| Gender (Female)^ | .388 (.083) | .295 | <.001 |  | .151 (.061) | .158 | .003 |
| Abused by more than one person | .055 (.044) | .041 | .212 |  | .055 (.044) | .057 | .216 |
| Number of abuse acts^ | .158 (.065) | .159 | .009 |  | -.020 (.038) | -.028 | .593 |
| Duration of abuse (in years) | .003 (.003) | .050 | .197 |  | .003 (.003) | .068 | .164 |
| Anxiety^ | .010 (.002) | .514 | <.001 |  | .002 (.001) | .151 | .004 |
| Dysthymia^ | .005 (.001) | .281 | <.001 |  | .008 (.001) | .662 | <.001 |
| **% variance explained** |  | **59%** |  |  |  | **56%** |  |

Note: ^ = Paths from variable to PTSD and DSO are freely estimated; PTSD = posttraumatic stress disorder; DSO = disturbances in self-organization; B = unstandardized beta values; β = standardized beta value; SE = standard error; p = statistical significance.

Figure 1. Alternative models of the symptom structure of ICD-11 CPTSD



Note: PTSD = Posttraumatic Stress Disorder; CPTSD = Complex Posttraumatic Stress Disorder; Re = Re-experiencing; Av = Avoidance; SoT = Sense of Threat; AD = Affective Dysregulation; NSC = Negative Self-Concept; IP = Interpersonal Problems; DSO = Disturbances in Self-Organization; x1-x12 = symptom indications of CPTSD

Figure 2. General model used to test differential prediction.

