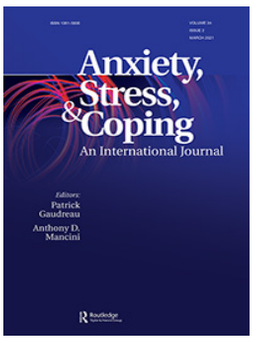

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ICD-11 posttraumatic stress disorder, complex PTSD and adjustment disorder: the importance of stressors and traumatic life events

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ABSTRACT

Background: Although ICD-11 adjustment (AjD), posttraumatic stress (PTSD) and complex posttraumatic stress (CPTSD) are commonly diagnosed disorders following exposure to stressful or traumatic life events, their dimensional structure and co-occurrence has never been tested in a single study. The present study explored the latent structure of AjD, PTSD, and CPTSD symptoms and their relationship to stressful and traumatic life events to determine the degree of distinctiveness between these constructs.

Methods: Participants were clinical patients ($N = 331$) who completed self-report measures of stressful and traumatic life events, AjD (The Adjustment Disorder – New Module 8 (ADNM-8)) and PTSD / CPTSD (The International Trauma Questionnaire – ITQ).

Results: Using confirmatory factor analysis, a second-order model comprised of correlated latent variables of AjD, PTSD, and CPTSD provided the best fit of the data. It was also found that stressors and traumatic life events were positively associated with all of these conditions although childhood trauma was only associated with CPTSD.

Conclusions: The current findings support the ICD-11 model of related-but-distinct stress-related disorders. We discuss the existence of a stress-response continuum and how the current findings impact the development of clinical interventions that may be shared across, or unique to, each stress-related disorder.

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Adjustment Disorder; Complex PTSD; PTSD; stressors; traumatic events

There has been ample evidence to suggest that stressful life events are highly prevalent in the general population (Kilpatrick et al., 2013) and can precipitate many disorders including psychotic, anxiety and affective disorders (e.g., Maniglio, 2009). However, only "Disorders Associated with Stress (DAS)," such as Posttraumatic stress disorder (PTSD) and Adjustment disorder (AjD) include exposure to a stressor as a qualifier for diagnosis. DAS are among the most widely used diagnoses by mental health care professionals. For example, amongst clinicians who use the ICD-10, PTSD is the eighth most frequently used diagnosis (Evans et al., 2013).

Significant controversy has been associated with AjD which has been described as the "waste-basket" of the psychiatric classification scheme (Casey & Bailey, 2011), predominantly due to its elusive description. With these criticisms in mind, the ICD-11 definition of AjD was much clearer

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compared to ICD-10, and describes it in terms of two sets of symptoms reflecting a maladaptive response to an identifiable stressor(s) characterised by (1) preoccupation with the stressor or its consequences and (2) a failure to adapt. Measures of AjD that are more aligned with this recent conceptualization are available. The "Adjustment Disorder New Module" (ADNM: Einsle et al., 2010) is a self-report measure developed pre ICD-11, and measured symptoms representing intrusions, avoidance, and failure to adapt along with secondary symptom groups (depressed mood, anxiety, and impulse control difficulties). A revised and abbreviated version of the scale, the ADNM-20 (Lorenz et al., 2016) was developed to more closely align to the ICD-11 proposals for AjD and this is reflected in its focus on the two core symptom clusters of preoccupations (4 items) and failure to adapt (4 items). However, it also includes four associated symptom clusters of avoidance (4 items), depression (3 items), anxiety (2 items), and impulsivity (3 items). There have been further abbreviations of the ADNM, namely an 8-item version (ADNM-8: Kazlauskas et al., 2018) and an "ultra-brief" 4-item version (ADNM-4: Ben-Ezra et al., 2018) both intended to focus specifically on the core AjD symptoms of preoccupations and failure to adapt.

The release of the ICD-11 also represented a major change in the conceptualization of PTSD, with a reduced symptom set reflecting the three core symptom clusters of re-experiencing, avoidance and sense of threat, and a "sibling" disorder Complex PTSD (CPTSD). CPTSD is comprised of the three PTSD clusters and three additional symptom clusters that reflect "Disturbances in Self-Organization" (DSO): (1) affective dysregulation, (2) negative self-concept, and (3) disturbances in relationships. Gate criterion for PTSD and CPTSD is traumatic life events exposure and significant impairment in functioning. The International Trauma Questionnaire (ITQ: Cloitre et al., 2018) was developed to measure both disorders. Extensive factor analytic research has been conducted (for a review and summary see Brewin et al., 2017) and most studies support a multi-dimensional structure with 6-first order factors, and a hierarchical structure with second-order factors representing PTSD and DSO. Considering AjD, PTSD and CPTSD together, alternative models could be proposed to describe their joint structure. These are shown in Figure 1.

Model 1 is a one-factor model where all symptoms load on the single latent variable labelled "Stress Response." Model 2 specifies the AjD, PTSD and DSO items as indictors of three first-order latent variables, labelled "Adjustment Disorder," "PTSD," and "DSO." This model assumes a unidimensional structure of each measure. Model 3 proposes eight correlated first-order latent variables, with

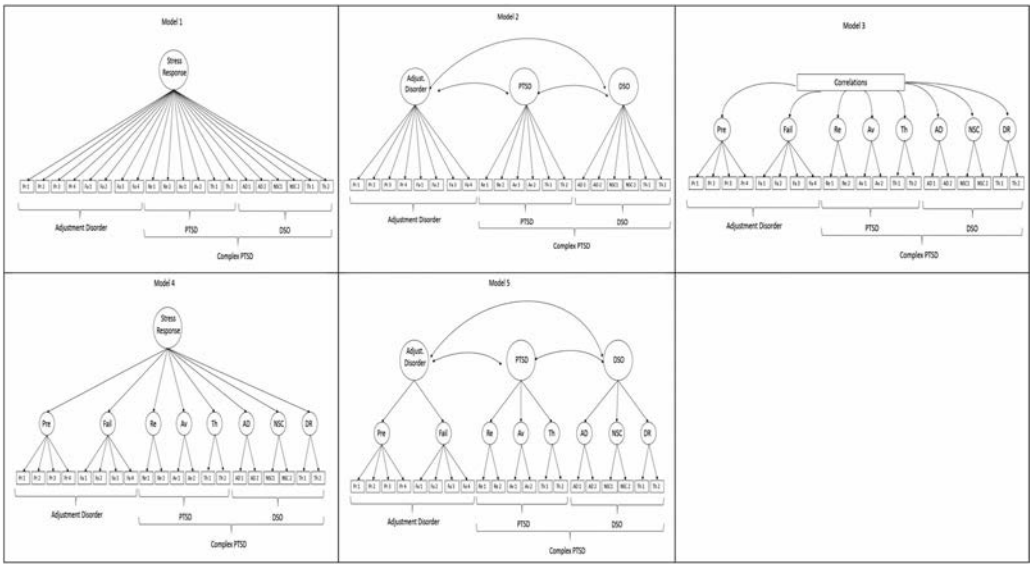

Figure 1. Alternative factor analytic models of ICD-11 adjustment disorder, PTSD, and DSO symptoms

each measure being multidimensional, but with no hierarchical organisation. Model 4 tests whether the variation and covariation among the eight first-order latent variables can be explained by a single second-order latent variables labelled "Stress Response." Model 5 most closely represents the ICD-11 representation of the three disorders; each measure is multidimensional and hierarchical. The AjD items were specified to measure two latent variables, "Preoccupation" and "failure to adapt," and the variation and covariation between these first-order latent variables were specified to be explained by a single second order latent variable labelled "Adjustment disorder." It also specified two correlated second-order factors (PTSD and DSO) to explain the covariation among the six first-order factors; re-experience, avoidance and sense of threat loaded on the PTSD factor and AjD, negative self-concept and affect regulation loaded on the DSO factor.

The ICD-11 classification system is hierarchical and, thus, if a person meets the diagnostic criteria for another disorder, that disorder should be diagnosed instead of AjD (Maercker et al., 2013a). According to ICD-11, AjD is caused by stressful life events whereas PTSD and CPTSD by traumatic life events. However, there is some evidence to suggest that AjD can be predicted both by stressful experiences and previous trauma exposure in the same sample (Mahat-Shamir et al., 2017). Thus, high degrees of association and comorbidity are expected amongst the different DAS because of the overlapping nature of their causal factors (i.e., stressor vs. traumatic event). Nevertheless, presence of comorbidity can complicate treatment plans and delay recovery from distress.

In summary, and considering the potential high degrees of comorbidity of the conditions, the latent structure of AjD, PTSD and CPTSD has never been tested in a single study. Furthermore, the overlap of these conditions has never been tested in a clinical sample. As noted earlier, a stressor is necessary for both AjD and PTSD or CPTSD but this could range from negative life events within the normal range of experience in the case of AjD to traumatic stressors of exceptional severity in the case of PTSD or CPTSD (Maercker et al., 2013b). It would certainly be useful to explore the predictive utility of different types of stressors to enable differential diagnosis for these conditions. With that in mind, the primary aim of this study was to test the dimensional latent structure of AjD, PTSD and CPTSD in a single study of a clinical sample to determine the degree of distinctiveness of these disorders. The analyses were based on the recently developed measures that reflect the newly released ICD-11 definitions; Adjustment Disorder – New Module 8 (ADNM-8: Kazlauskas et al., 2018) was used to measure AjD and the International Trauma Questionnaire (Cloitre et al., 2018) to measure PTSD and CPTSD. Five alternative factor analytic models were specified and tested based on data from a sample of clients attending a specialist centre for treatment for exposure to psychological trauma. It was predicted that each disorder would be best represented by hierarchical and multidimensional models. The choice of optimal model was not necessarily based on model fit, as hierarchical models cannot fit the data better than the model with correlated first-order factors (replacing first order correlations with a smaller number for second-order loadings will always lead to a deterioration in fit). The choice of model was a compromise between model fit and parsimony; judging whether poorer fit for a hierarchical could be justified on the basis of a simpler, more parsimonious, model. The "best" fitting model was then extended to include variables representing childhood trauma and adversity, lifetime stressors, and lifetime trauma exposures as predictors of the latent variables representing AjD, PTSD and CPTSD.

Methods

Participants and procedures

Participants in this study were individuals who self-referred in a trauma centre in Scotland. The study was approved by the South East Scotland research ethics service. Participants provided written consent for their participation. All 331 new patients over the 8 month recruitment period were invited to complete a set of standardised measures as part of an initial assessment. The mean age of the sample was 39 years (SD = 12.46) and there were more females (62.1%) than males. Most of

the participants were born in the United Kingdom (92.5%). Of the sample, 41.4% were employed, 29.8% were unemployed, 7.7% were home keepers, 6.9% were students and the others were either retired or economically inactive due to ill-health. Approximately one third of the participants were living alone (32.9%), 26.7% lived with a partner and/or family, 2.4% lived with friends (and the 37.9% reported "Other").

Measures

ICD-11 PTSD and CPTSD

The *International Trauma-Questionnaire (ITQ*: Cloitre et al., 2018) is a self-report measure of ICD-11 PTSD and CPTSD. The ITQ is comprised of two sections measuring the six symptoms of PTSD distributed across the three clusters of re-experiencing, avoidance and sense of threat; and the six symptoms of Disturbances of Self-organisation (DSO) distributed across the three clusters of affective dysregulation, negative self-concept and disturbed relationships. Each cluster contains 2 items. The Life Events Checklist was presented before the ITQ, and participants were asked to

> Please identify the experience that troubles you most and answer the questions in relation to this experience. Below are a number of problems that people sometimes report in response to traumatic or stressful life events. Please read each item carefully, then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

All items are responded to using a Likert scale ranging from 0 ="*Not at all"* to 4= "*Extremely*." For PTSD, participants are asked to rate how much they have been bothered by their symptoms in the last month. The diagnostic criteria for PTSD require participants to endorse one symptom in each cluster by a score of ≥2, as well as evidence of functional impairment associated with these symptoms which is constituted by a score of ≥2 in the domain(s) of social life, work-life and/or other important obligations. For the DSO symptoms, participants are instructed to report how they typically feel, think about themselves, and relate to others. For a diagnosis of CPTSD, participants must endorse one symptom (score of ≥2) in each PTSD cluster and one symptom in each DSO cluster, and evidence functional impairment in relation to the PTSD and DSO symptoms alike. The ITQ has been validated in several populations (Karatzias et al., 2017b) and the internal reliability as measured by Cronbach's α was acceptable in the current study; PTSD, $\alpha = .76$; DSO, $\alpha = .84$; full scale, $\alpha = .86$.

Adjustment disorder

Adjustment disorder was measured using the Adjustment Disorder – New Module 8 (ADNM-8: Kazlauskas et al., 2018) which is an abbreviated form of the Adjustment Disorder – New Module 20 (ADNM-20; Einsle et al., 2010). The ADNM-8 is an 8-item self-report measure that consists of 2 subscales: preoccupation (4 items: e.g., I have to think about the stressful situation a lot and this is a great burden to me) and failure to adapt/functional impairment (4 items: e.g., Since the stressful situation, I can no longer sleep properly). Preoccupation and failure to adapt are the core symptoms of the new ICD-11 AjD diagnosis and were used in this analysis. Participants are first presented with a 16-item stressor list with the instructions

> Below is a list of stressful life events. Please indicate those events that happened during the past 1 or 2 years and are currently a very strong burden to you, or have burdened you in the last six months. You can indicate as many events as applicable.

The stressors tap a range of issues relating to problems associated with relationships (e.g., Divorce/separation, Family conflicts), work (e.g., Conflicts in work life, Unemployment, Too much or too little work), death and illness (e.g., Illness of a loved one, Death of a loved one, Own serious illness) and other stress events (e.g., Serious accident, Assault, Moving to a new home). The items were scored Yes = 1 and No = 0, and summed to represent cumulative stress.

The 8 preoccupation and failure to adapt items are presented with the instructions "The events you have just indicated can have numerous consequences for our well-being and behavior. Below you will find various statements about which reactions these types of event can trigger. Please indicate how often the respective statement applies to you ("never" to "often")". These items are responded to using a 4-point Likert scale (1 = Never to 4 = Often) indicating how often they have experienced the symptoms during the past two weeks. The scores on the preoccupation and failure to adapt scales have a possible range of 4–16, with higher scores reflecting higher levels of severity. A diagnosis of probable AjD can also be made based on the algorithm proposed by Lorenz et al., (2016), and this is defined by one item rated ≥3 and at least two items rated ≥2 for each core symptom scale, and a rating ≥3 on the impairment criterion ("All in all, the situation causes serious impairment in my social life or occupational life, my leisure activities or other important areas of functioning"). Evidence supporting the reliability, construct validity and diagnostic utility of ADNM-8 score has been presented by Ben-Ezra et al. (2018). Cronbach's alpha for the Preoccupation ($\alpha = .80$) and Failure to Adapt ($\alpha = .78$) scale s were acceptable.

Traumatic and stressful life events

The Life Events Checklist (LEC: Gray et al., 2004) is a 17-item self-report measure designed to screen for potentially traumatic events in a respondent's lifetime. The LEC assesses life time exposure to 16 traumatic events (e.g., Natural disaster, Physical assault, Life threatening illness/injury) and the 17th item, "Any other very stressful event/experience," can be used to indicate exposure to a trauma that is not listed. For each item, the participant indicated if the event "Happened to me" (1), "Witnessed it happening to somebody else" (2), "Learned about it happening to someone close to me" (3), "Part of my job" (4), "Not sure it applies" (5), "Doesn't apply to my experience" (6). The items were recoded into binary variables ("Happened to me" = 1, all other responses = 0) except item 14 (Sudden violent death, for example, homicide, suicide) and 15 (Sudden accidental death) where "Happened to me/Witnessed it happening to somebody else" represented endorsement. Summed scores on the LEC, excluding the 17th item, have a possible range from 0 to 16.

The Adverse Childhood Experiences scale (ACE: Felitti et al., 1998) is a 10-item self-report measure of emotional (e.g., Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you?), physical abuse (e.g., Did a parent or other adult in the household often push, grab, slap, or throw something at you?), sexual abuse (e.g., Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way?), physical neglect (e.g., You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?), and household dysfunction (e.g., Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?). Responses were binary scored (Yes = 1, No = 0) and summed, with a possible range of scores of 0–10.

Statistical analysis

All factor analytic analyses were conducted using Mplus 7.4 (Muthén & Muthén, 2012). The ADNM-8 uses a 4-point response format and the ITQ uses a 5-point response format, so model estimation using either robust maximum likelihood (MLR: Yuan & Bentler, 2000) or weighted least squares means and variance adjusted (WLSMV: Muthén, du Toit, & Spisic, 1997) may be appropriate. There is evidence that WLSMV estimation based on the polychoric correlation matrix of latent continuous response variables is more appropriate when indicators have fewer than 5 response categories; in this context MLR tends to under-estimate factor loadings, but inter-factor correlations may be under-estimated based on WLSMV (Rhemtulla et al., 2012). All models were, therefore, estimated using both MLR and WLSMV to help with deciding on the selection of the best-fitting model.

Goodness of fit for each model was assessed with multiple fit indices; the chi-square statistic (χ^2), the Comparative Fit Index (CFI; Bentler, 1990), and the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973). A non-significant χ^2 ($p > .05$) and values greater than .90 for the CFI and TLI were considered

to reflect acceptable model fit. The Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) was also used, where a value less than .05 indicated close fit and values up to .08 indicated reasonable errors of approximation (Jöreskog & Sörbom, 1993). The same cut-off values were used for the Standardised Root Mean Square Residual (SRMR; Jöreskog & Sörbom, 1981). The Bayesian Information Criterion (BIC; Schwarz, 1978) was used to compare the relative fit of the models. The model with the lowest BIC was considered to be the better model, and a difference greater than 10 was considered to be indicative of a "significant" difference (Raftery, 1995). All second-order factors were allowed to correlate. For all models the unique variances, or measurement errors, were specified as uncorrelated.

At the variable level there was a modest amount of missing data, ranging from .8% to 12.5%, and pairwise missingness ranged from 2.1% to 15.5%. The missing values were considered to be missing completely at random (Little's test: Chi-Square = 640.911, df = 613, $p = .211$). Missing data were handled by full-information maximum likelihood estimation using all available data, and this has been shown to be superior to listwise or pairwise methods (Schafer & Graham, 2002).

Results

Adverse life experiences and life stressors

The participants experienced multiple stressors and traumatic life events. Scores on the summed ACE variable ranged from 0 to 10, with a mean of 4.23 (SD = 2.70) and median of 4. The most commonly reported adverse experiences were emotional abuse (63.7%: Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid you might be physically hurt?), emotional neglect (57.1%: No one in your family loved you or thought you were important or special? Or Your family didn't look out for each other, fell close to each other, or support each other?), household (55.2%: household member depressed or mentally ill or did a household member attempt suicide?), 52.2% (Parents ever separated or divorced?). Rates of sexual abuse (40.5%: Touch or fondle you or have you touch their body in a sexual way? Or Try to or actually have oral, anal, or vaginal sex with you?) and physical abuse (45.8%: Push, grab, slap, or throw something at you? Or Ever hit you so hard that you had marks or were injured?) were high.

Scores on the summed ADNM – 20 stressor list ranged from 0 to 13, with a mean of 4.79 (SD = 2.68) and median of 5. The most commonly reported stressors were "Family conflicts" (58.5%), "Financial problems" (50.5%), "Too much or too little work" (48.0%), and "Illness of a loved one" (41.2%). Scores on the summed LEC ranged from 0 to 14, with a mean of 3.99 (SD = 2.70) and a median of 4. The most commonly reported traumatic events were "Physical assault" (64.8%), "Sexual assault" (52.7%), "Other unwanted or uncomfortable sexual experience" (55.2%), and "Assault with a weapon" (33.9%). Bivariate correlations between the scores on the stressor measures and the ADNM and ITQ subscales are reported in Table 1.

AjD, PTSD and CPTSD diagnoses

Without applying exclusion rules a large proportion of the sample met the diagnostic criteria for AjD ($n = 233$; 70.6%), and CPTSD ($n = 214$; 64.8%) was more common that PTSD ($n = 42$; 12.7%). There was a significant association between diagnostic status for AjD and PTSD/CPTSD (χ^2 (2) = 19.39, $p < .01$); of those who met the diagnostic criteria for AjD, 72.1% ($n = 238$) met the criteria for CPTSD and 11.2% ($n = 40$) for PTSD. In total, 83.3% ($n = 274$) of participants who met the criteria for AjD also met the criteria for either PTSD or CPTSD. ICD-11 indicates a hierarchical structure of diagnoses, so excluding those participants who met the criteria for PTSD or CPTSD results in 11.8% ($n = 39$) of the total sample with a probable diagnosis of adjustment disorder. The fit statistics for the CFA models are reported in Table 2.

Table 1. Bivariate correlations between stressor measure scores and ADNM and ITQ subscale scores.

	1	2	3	4	5	6	7	8	9	10
1. ACE	—									
2. ADNM Stressors	.20**	—								
3. LEC	.34**	.30**	—							
4. AjD: Preoccupation	.11	.29**	.17**	—						
5. AjD: Failure to adapt	.19**	.38**	.26**	.55**	—					
6. PTSD: Re-experiencing	.09	.20**	.24**	.39**	.39**	—				
7. PTSD: Avoidance	.04	.13*	.13*	.20**	.26**	.36**	—			
8. PTSD: Sense of threat	.04	.15**	.10	.30**	.25**	.41**	.40**	—		
9. DSO: Affective dysregulation	.14**	.19**	.22**	.37**	.47**	.36**	.40**	.40	—	
10. DSO: Negative Self Concept	.15**	.21**	.18**	.40**	.38**	.32**	.32**	.37**	.55**	—
11. DSO: Disturbed Relationships	.21**	.20**	.17**	.25**	.47**	.26**	.31**	.24**	.55**	.51**

Note: ACE = summed score Adverse Childhood Experiences Scale; ADNM Stressors = summed score on the Adjustment Disorder Stressor checklist; LEC = summed score on the Life Events Checklist; AjD = Adjustment Disorder; PTSD = Posttraumatic Stress Disorder; DSO = Disturbances of Self-Organisation.

Table 2. Fit statistics for the alternative models of the ICD-11 adjustment disorder, PTSD and DSO symptoms.

Model		Chi-square (df)	RMSEA [90% CI]	CFI	TLI	SRMR	BIC
1. 1 Factor model	MLR	885.172 (170)**	.113 [.106, .120]	.591	.542	.092	17,687.099
	WLSMV	1225.256 (170)**	.137 [.130, .145]	.823	.802	.112	
2. 3 Factor model	MLR	609.103 (167)**	.090 [.082, .097]	.747	.712	.077	17,300.195
	WLSMV	622.333 (167)**	.091 [.083, .099]	.924	.913	.075	
3. 8 First order	MLR	267.208 (142)**	.052 [.042, .061]	.928	.904	.050	17,040.908
	WLSMV	304.115 (142)**	.059 [.050, .068]	.973	.964	.048	
4. 8 First order, 1 s order	MLR	363.547 (162)**	.061 [.053, .070]	.885	.865	.076	17,054.734
	WLSMV	529.270 (162)**	.083 [.075, .091]	.938	.928	.074	
5. 8 First order, 3 s order	MLR	313.961 (159)**	.054 [.046, .063]	.911	.894	.062	17,001.674
	WLSMV	371.328 (159)**	.064 [.055, .072]	.964	.957	.058	

* $p < .05$, ** $p < .01$;

The latent structure of AjD, PTSD, and CPTSD

The multidimensional models with 8 first-order factor factors fitted the data better than the 1 and 3 factor models, based on both the MLR and WLSMV derived fit indices. The model with 8 first order and 3 s order factors was considered the "best" fitting model, that is, balanced model fit and simplicity. The absolute fit statistics tended to support the first-order variant of this model, but the BIC indicated that the model with fewer parameters was superior. The RMSEA, CFI and SRMR all indicated acceptable fit, although the TLI was marginally too low. The BIC indicated that this model was better than Models 3 and 4. The standardised factor loadings are shown in Figure 2.

All the loadings are positive and statistically significant ($p < .05$). The loading for the AjD latent variable and the DSO second order latent variable was out of bounds ($\lambda = 1.12$); this has been reported in other factor analytic studies of the ITQ (Hyland et al., 2017) and is due to the high correlation among the first order factors (Jöreskog, 1999). The correlations among the second order latent variables were all positive and statistical significant (AD-PTSD $r = .60$; AjD-DSO $r = .73$; PTSD-DSO $r = .73$). The magnitude of the correlations indicate that the latent variables are associated but relatively distinct as the shared variance ranges from 36% to 53%. Composite reliability (CR) was calculated for indicators for all first- and second-order factors: Pre = .757, Fail = .794, RE = .733, AV = .613, Th = .748, AD = .505, NSC = .913, DR = .785, AdD = .815, PTSD = .808, DSO = .929.

The variables representing the summed scores on the ACE, ADNM-20 stressor checklist, and the LEC were added to the model and were specified to be correlated; the three second order factors were regressed on these three trauma variables. The model fitted the data well ($\chi^2 = 377.59$, df = 210, $p > .05$; RMSEA = .049, 90% CI = .041 – .057; CFI = .915; TLI = .898; SRMR = .058) with the

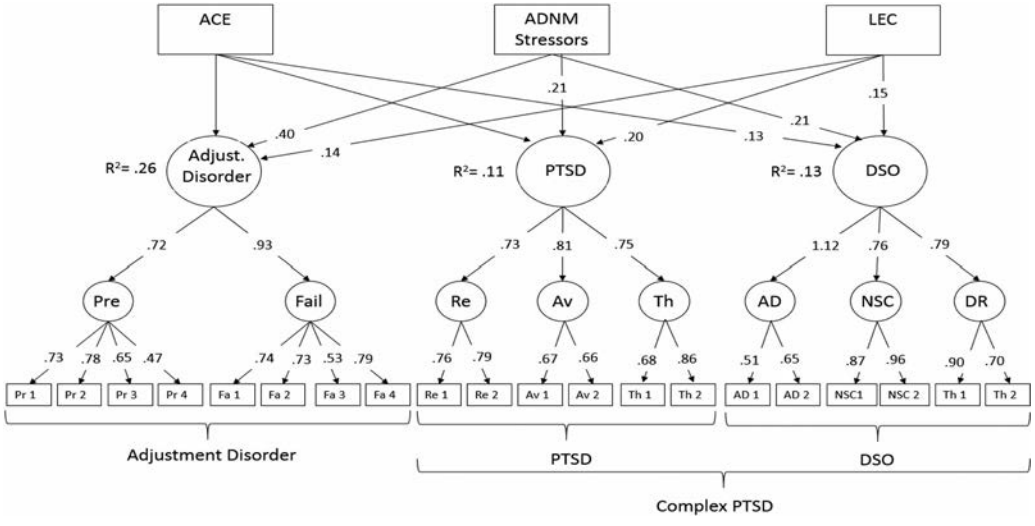

Figure 2. Estimates from the factor analytic and regression model of ICD-11 adjustment disorder, PTSD and DSO symptoms.
Note: ACE, ADNM, and LEC variables were correlated. Only significant ($p < .05$) standardised regression coefficients are shown.

standardised regression coefficients are shown in Figure 2. The AjD latent variable was predicted by most strongly by the variable ADNM – 20 stressor variable ($\beta = .40$, $p < .05$) and also the LEC variable ($\beta = .14$, $p < .05$). The PTSD latent variable was predicted by the variable ADNM stressor variable ($\beta = .21$, $p < .05$) and also the LEC variable ($\beta = .20$, $p < .05$) and the magnitude of the effects were very similar. The DSO latent variable was predicted by the ACE variable ($\beta = .13$, $p < .05$), the ADNM stressor variable ($\beta = .21$, $p < .05$) and also the LEC variable ($\beta = .15$, $p < .05$). The DSO latent variable was the only latent variable that was predicted by the ACE variable.

Discussion

Although ICD-11 AjD, PTSD and CPTSD are common disorders following exposure to life events, their dimensional structure and co-occurrence had never been tested in a single study or using data from a clinical population. We addressed this gap in the literature by investigating the dimensional latent structure of AjD, PTSD and CPTSD in a single clinical sample to determine the degree of distinctiveness of these disorders. We have also explored the predictive utility of different types of stressors of these disorders. It was found that although there is a high degree of comorbidity across these three conditions their symptom profile is unique and distinct. It was also found that stressors and traumatic life events are significantly associated with all these conditions although childhood adversity was only significantly associated with CPTSD.

Main findings and directions for future research

A high degree of comorbidity was observed, particularly in relation to AjD and CPTSD. Although the relationship between the two conditions has not been explored before, there is evidence to suggest that CPTSD is a highly comorbid condition (Hyland et al., 2018). The high co-occurrence between PTSD, CPTSD and AjD can also be understood through the perspective of a dimensional model of psychopathology (see Kotov et al., 2017). According to the dimensional model of psychopathology, "disorders" such as PTSD, CPTSD, AjD are all observable manifestations of an underlying "internalizing" latent variable. Consequently, these disorders are expected to covary, and the more precisely any given "disorder" is measured, the higher its association with any other internalizing "disorder" will be.

The common risk factors observed (i.e., life stressors and traumatic life events) in all three conditions might also explain the high degree of co-occurrence. A recent meta-analysis of 22 studies by Larsen and Pacella (2016) concluded that while non-traumatic life stressors were associated with PTSD symptom severity, a stronger association existed between traumatic events and PTSD. However, in line with previous recent research in the area (e.g., Mahat-Shamir 2017), it was found that traumatic life events and stressors are all risk factors for AjD, PTSD and CPTSD. Although, the temporal nature of exposure to stressful life events and traumatic life events has not been considered in the present study, our findings support the presence of a "sensitization" process that puts individuals that have experienced life stressors, at risk of developing PTSD, CPTSD and/or AjD. There is clearly a need for further longitudinal research on the unique qualities of stressful life events and traumatic life events, although the present results suggest that the two are very similar in relation to their impact. Indeed, stressful and traumatic life events share many qualities (i.e., both can be experienced as threatening) although there is a tendency to think of traumatic life events as more impactful. Further research is required on the unique quality of stressors and traumatic events and why / how they cause less (AdD) or more severe reactions (PTSD / CPTSD). The role of resilience in this process might be pivotal. Crane et al. (2018) suggested a model of resilience discussing how the experience of stressors and adversity may have resilience-strengthening opportunities. The model highlights the importance of a specific meta-cognitive skill (i.e., self-reflection on one's initial stressor response) as a mechanism for strengthening resilience. The self-reflective process is proposed to strengthen a person's resilience by developing insight into their capacities, the limitations of these capacities, and by stimulating the search for alternative approaches. With that in mind, it might well be the case that similar processes operate for both life stressors and traumatic events with similar effects on mental health. In line with previous research in the area (e.g., Karatzias et al. 2017), it was not surprising that childhood adversity uniquely predicted CPTSD. There has been plenty of evidence suggesting that childhood trauma impacts on the development of emotion regulation, identity and relational capacities (Courtois & Ford, 2009) predominantly because of the disruptions caused in the attachment processes that occur during childhood (Charuvastra & Cloitre, 2008). Finally, this study has modelled the association between dimensional representations of AjD, PTSD and DSO and how stressors and traumas predict these dimensions. Future research may consider the co-occurrence of these disorders at the diagnostic level; mixture modelling may be an appropriate way to model the occurrence and co-occurrence of disorders and examine the degree to which stressors and traumas predict different diagnostic profiles.

Limitations

A number of limitations can be observed in this study. First, our findings require replication in larger samples and general populations across different cultures. Our sample was fairly homogenous and predominantly consisted of people who had experienced exposure to repeated or numerous types of childhood trauma. It might also be useful to replicate these findings in a population primarily exposed to life stressors as opposed to traumatic life events. Second, it was not possible to consider the temporal nature of stressors / traumatic life events and the development of co-morbid conditions. Thus it is was not possible to determine whether AjD preceded or followed PTSD and CPTSD in a single patient. Third, there is similarity in the description of stressors and traumas; although this was, to a degree, controlled for statistically, a clearer delineation between these types of experiences would be beneficial. Future studies should examine the co-occurrence of stressors and traumas and model these using mixture models (for an overview, see O'Donnell et al., 2017).

Clinical implications

Notwithstanding its limitations, this is the first study that explored the co-occurrence of AjD, PTSD and CPTSD in a single clinical sample. Unfortunately, the high co-occurrence of these conditions is

against the primary aim of ICD-11 to reduce co-morbidity. The issue of co-morbidity is an important one as it has important implications for the treatment of these conditions. If the comorbidity is due to symptom overlap, then the same treatment strategies that are effective with one condition could be offered to people with two of these disorders. If the comorbidity represents a distinct phenotype of disorders associated with stress, then treatment approaches that target specific aspects of one condition may be less effective to someone who present with comorbidity. It is encouraging that our results suggest that these three disorders represent distinct phenotypes. An important step in identifying interventions that are particularly or more precisely relevant to the treatment of these conditions is to further explore and better understand the role of certain psychological treatment components associated with each of the conditions, understand their relationship to one another and consider interventions or identified mechanisms of action that may be relevant to their resolution (e.g., Karatzias et al., 2018). This will enable the development of unique treatment approaches that target the symptom profile of each of these conditions.

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