The Dissociative Subtype of Post-Traumatic Stress Disorder: Understanding Prevalence, Course, Prognosis, Characteristics, Severity, and Functional Impairment

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Thesis Portfolio Abstract

A separate dissociative subtype of post-traumatic stress disorder (PTSD-DS) has been described in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. It has been suggested that PTSD-DS represents a small proportion of individuals with PTSD and may be a more pathological and severe subtype, however, there has been limited investigation of this subtype, especially in children, following various forms of traumatic experience. A systematic review and meta-analysis were conducted, synthesising the current evidence relating to point prevalence of a PTSD-DS in children and adults (as a proportion of those with PTSD). In addition, empirical analysis was conducted of pre-existing data from two longitudinal studies of children and adolescents; one in which they had experienced a single-event trauma, the second in which they were under the care of a local authority and had experience of abuse or neglect. Meta-analysis of 49 studies (53 samples; $N = 8214$) estimated the point prevalence of PTSD-DS in children and adults to be 38.1% (95% CI 31.5–45.0%). Prevalence of PTSD-DS was significantly higher for children compared to adults, and when prevalence was determined by diagnostic or clinical cut-off methods compared to latent class and profile analyses (exploratory methods that determine hidden groups based on the means of categorical and continuous variables respectively). Results of the empirical study found that: PTSD-DS was common in children with PTSD, early PTSD-DS showed similar natural recovery to early PTSD, and PTSD-DS was predictive of later PTSD following single-event trauma. Dissociation did not appear to be an important factor in post-traumatic stress symptoms or functional impairment following single- or multi-event trauma. The results of both studies suggest that PTSD-DS is relatively common, especially in children. PTSD-DS may offer little clinical utility to the extant PTSD diagnosis, and dissociation may simply be a typical part of the PTSD presentation in children. Further research is warranted into PTSD-DS following different forms of trauma and in larger samples of participants with this subtype.

Access Condition and Agreement

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Chapter 1. Introduction to the Thesis Portfolio

Janet (1907) posited a link between traumatic experience and dissociative symptoms over 100 years ago, and furthermore Freud (1962) suggested that dissociation might be a defence mechanism against the overwhelming affect associated with childhood trauma, particularly sexual abuse. Dissociative symptoms, in the context of dissociative disorders, can be thought of as "a disruption of and or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, and behavior" from a contemporary understanding of psychopathology [American Psychiatric Association (APA), 2012, p. 291]. Alternatively, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) define dissociation as "the splitting off of clusters of mental contents from conscious awareness… often a result of psychic trauma, dissociation may allow the individual to maintain allegiance to two contradictory truths while remaining unconscious of the contradiction" (APA, 2013, p. 280). This second definition of dissociation is more appropriate in the context of a diagnosis of post-traumatic stress disorder (PTSD), as dissociation often takes a relatively mild to moderately severe form that can still be disruptive and cause functional impairment; however, it may not be as pervasive and debilitating as in dissociative disorders (Ginzburg et al., 2009; Waelde et al., 2009). After all, dissociation spans a broad range of different experiences; from slight lapses in awareness that are considered typical, to distorted self-perception as might be seen in individuals with the dissociative subtype of PTSD (PTSD-DS), to marked dissociation from identity that one might expect in individuals with dissociative identity disorder (Carlson et al., 2012). Some have argued that dissociation should not be considered a pathological response (Horowitz, 1986); a theory tested by Sterlini and Bryant (2002) who showed that following a significant stressor (skydiving from a plane), significant levels of dissociation were elicited in healthy adults where the frequency of dissociation was comparable to that seen in clinical

populations. Perhaps then dissociation is a normal and natural experience following a variety of different events, even including those that can be considered non-traumatic.

PTSD was first described in the third edition of DSM-III (APA, 1980) as an anxiety disorder. In DSM-5, PTSD is classified as a trauma- and stressor-related disorder, and individuals who endorse the required number of symptoms in the domains of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity, following a traumatic event meet the criteria for a diagnosis of PTSD (APA, 2013). Also stipulated in the DSM-5 are the criteria required for a diagnosis of the PTSD-DS where, in addition to first meeting the criteria for PTSD, individuals must also show symptoms of depersonalisation and or derealisation. Depersonalisation involves "persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one's mental processes or body" (APA, 2013, p. 272), and invokes a distorted perception of self, of various parts of one's body, and of one's feeling of agency (Carlson et al., 2012). Derealisation takes the form of "persistent or recurrent experiences of unreality of surroundings" (APA, 2013, p. 272), and refers to a distorted perception of one's surroundings and context, objects, and events (Carlson et al., 2012).

The trauma model of dissociation suggests that dissociation follows trauma and psychological adversity, as a way distancing oneself emotionally, cognitively, physiologically, and behaviourally (Nijenhuis et al., 1998; Putnam, 1985; 1997; Spiegel, 1984; Spiegel & Cardeña, 1990; van der Kolk, 1987; van der Kolk & van der Hart, 1989), and is a common reaction (Bryant, 2007). The salience of these dissociative responses fade with time in individuals that recover, and a reduction in functional impairment is experienced (Dalenberg & Carlson, 2012). In individuals who do not recover, conditioning to trauma related stimuli may illicit a similar response to that of the time of trauma, for example further dissociation (Dalenberg & Carlson, 2012). Whilst these responses may not be intentional, any deliberate effort of the individual to avoid reminders of the trauma may only serve to reinforce the dissociative responses (Dalenberg & Carlson, 2012). The

review of Dalenberg, Brand et al. (2012) examined the wider literature on the trauma

model of dissociation and concluded that there was strong evidence to support it.

Due to increased interest in dissociation in the context of trauma and post-traumatic

stress, other models have been put forward to further explain the link between PTSD and

dissociation, for example the Fantasy Proneness, Mediation, and Comorbidity Models (see

Dalenberg & Carlson, 2012 for more detail and empirical evidence for and against each

model). The Component and Subtype Models posit dissociation as just one component of

the post-traumatic stress response (Dalenberg & Carlson, 2012). In the Component Model

specifically, dissociation forms an integrated part of the clustered symptoms that increase

the likelihood of PTSD but is not necessarily present in every case of PTSD, much like

other PTSD symptoms. Here, dissociation symptoms include re-experiencing (for example,

feeling as if the event was re-occurring) and avoidance or distancing (for example,

memory fragmentation, depersonalisation, and derealisation). The Subtype Model, by

contrast, assumes that increased levels of dissociation change the symptomology of the

PTSD itself, and that the subtype is related to specific clinical characteristics and

comorbidities that differ from that of 'classic' PTSD (Dalenberg & Carlson, 2012).

Therefore, this suggests that there may be a subset of individuals that have a subtype of

PTSD that is phenomenologically different which presents with its own epidemiological

features (see Schiavone et al., 2018 for a review). It has been suggested that a more

dissociative presentation has a more severe presentation overall (Armour, Elklit et al.,

2014), with increased associated self-harming behaviours, suicidality, and disordered

eating (Briere et al., 2010; Carlson et al., 2013). Additionally, there is neurobiological

evidence for a dissociative subtype of PTSD where, broadly, individuals who dissociate

following a trauma tend to show less brain activity in regions associated with fear (namely,

the amygdala) and more activity in regions associated with emotion regulation (namely,

the anterior cingulate cortex; Schiavone et al., 2018). PTSD-DS is also associated with

differences in brain structure and function in areas involved in sensory integration and self-

perception (see Schiavone et al., 2018). Therefore, there is compelling evidence that provides support to the Subtype Model.

Dalenberg and Carlson (2012) were correct when they stated that "the inclusion of dissociative symptoms in the diagnostic criteria would result in an expansion of empirical research" (p. 558), as the Subtype Model of dissociation has received significant attention following the creation of the PTSD-DS diagnosis in the DSM-5 (Hansen et al., 2017; Schiavone et al., 2018). The DSM-5 criteria for PTSD have been criticised by many (Friedman et al., 2016; Hoge et al., 2016). Specific criticism concerns how PTSD criteria already take dissociative experiences into account (Ross, 2021), specifically the intrusion criterion "dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring'' (APA, 2013, p. 271), and the negative alterations in cognitions and mood criterion "inability to recall an important aspect of the traumatic event(s)" (APA, 2013, p. 271). A second criticism surrounds the domains of dissociation chosen as necessary criteria in order to achieve a diagnosis of PTSD-DS according to DSM-5, where Ross (2021) believes that the current criteria are too narrow and should include other domains of dissociation. It has been suggested that dissociative amnesia (Wolf et al., 2017), and flashbacks (Dahal et al., 2018; Hyland et al., 2017) are common in individuals with PTSD, and memory disturbance, disengagement, time loss, and trance (Frewen et al., 2015), gaps in awareness, re-experiencing, and sensory misperception (Műllerová et al., 2016; Ross et al., 2018) are all associated with PTSD-DS. This criticism invites further research, and in part it is an aim of this thesis portfolio, to investigate whether the DSM-5 PTSD-DS criteria is fit for purpose and appropriate for use.

A variety of methods have been used to identify PTSD-DS in a variety of different populations such as taxometric methods (Waelde et al., 2005; Waller & Ross, 1997) and signal detection analyses (Ginzburg et al., 2006), making it challenging to make comparisons between studies. More recently, latent class and profile analyses (LCA and LPA respectively) have been used extensively to identify and establish the prevalence of

PTSD-DS (Dalenberg, Brand et al., 2012). These methods determine how many classes or profiles of individuals statistically provide the best fit within a sample and are therefore a helpful way of exploring diagnostic subtypes. Other studies have rigorously used the new DSM-5 cluster-based criteria or validated cut-offs on measures assessing post-traumatic stress symptoms and dissociation. These latter techniques are less about exploring whether a subtype exists, but instead detail exactly how many individuals with PTSD also have PTSD-DS according to set criteria. Regardless of which method is used to estimate prevalence, there is a large degree of heterogeneity in the literature concerning both the prevalence and risk factors for PTSD-DS (Hansen et al., 2017), and a lack of research into child and adolescent PTSD-DS generally.

The aim of this thesis portfolio is to investigate this recently defined yet poorly understood diagnosis to inform best practice and treatment in the future for individuals with dissociative PTSD. Addition of the dissociative subtype of PTSD to the DSM-5 diagnostic criteria, criticism of its inclusion, lack of clarity around exactly how prevalent PTSD-DS is, and how dissociation fits into the broader picture of PTSD, all motivate further exploration of this subtype. The only review, to the author's knowledge, exploring the prevalence of this new DSM-5 diagnosis is that of Hansen et al. (2017). However, this review was limited exclusively to studies utilising LCA and LPA to explore the existence of a dissociative subtype, and the various prevalence values were averaged without any weighting procedure. The point prevalence of PTSD-DS therefore warrants further investigation, taking account different methods of prevalence estimation and use of meta-analysis methodology, which has the advantage of producing a weighted average of prevalence across a range of studies. Chapter 2 of this thesis portfolio therefore aims to conduct a broad and comprehensive systematic review of the literature and meta-analysis detailing the point prevalence of PTSD-DS.

Following on from this, Chapter 3 serves to bridge the gap and present theoretical links between the systematic review and the empirical study (Chapter 4), in the context of the wider literature around PTSD-DS.

In Chapter 4, PTSD-DS will be explored further in two samples of children following different forms of traumatic exposure: the first being children who experienced a single-event trauma, and the second children who had been removed from their family home and were in the care of a nonbiological foster carer, kinship care, or residential care home following abuse or neglect. The diagnosis of PTSD-DS will be explored in these two samples with respect to: point prevalence, course, predictive value, severity, functional impairment, and characteristics, with the aim of better understanding this diagnosis in children following different forms of trauma.

Chapter 5 and 6 offer the opportunity to present further methodology and results for both the systematic review and the empirical studies. These should be considered supplementary to the information presented in Chapters 2 and 4; this information not being included earlier due to restrictions on word count stipulated by journals for publication.

The final chapter details an overall integrated summary of the findings from both the systematic review and the empirical study and offers a critical appraisal of the strengths and weaknesses of these studies, alongside the thesis portfolio as a whole. Both clinical and theoretical implications are presented, followed by considerations for suitable future research. Additionally, the author's own reflections on the process of completing this thesis portfolio is presented. Finally, an overall conclusion to the thesis portfolio as a whole is given.

Chapter 2. Systematic Review

Prevalence of the Dissociative Subtype of Post-Traumatic Stress Disorder: A Systematic Review and Meta-Analysis

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Chapter written according to the author guidelines stipulated by *Psychological Medicine* (Appendix A)

Abstract

The dissociative subtype of post-traumatic stress disorder (PTSD-DS) was introduced in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and is characterised by symptoms of either depersonalisation or derealisation, in addition to a diagnosis of post-traumatic stress disorder (PTSD). This systematic review and meta-analysis sought to estimate the point prevalence of current PTSD-DS, and the extent to which method of assessment, demographic and trauma variables moderate this estimate, across different methods of prevalence estimation. Studies included were identified by searching MEDLINE (EBSCO), PsycInfo, CINAHL, Academic Search Complete, and PTSDpubs, yielding 49 studies that met the inclusion criteria ($N = 8214$ participants). A random effects meta-analysis estimated the prevalence of PTSD-DS as 38.1% (95% CI 31.5–45.0%) across all samples, 45.5% (95% CI 37.7–53.4%) across all diagnosis-based and clinical cut-off samples, 22.8% (95% CI 14.8–32.0%) across all latent class analysis (LCA) and latent profile analysis (LPA) samples, and 48.1% (95% CI 35.0–61.3%) across samples which strictly used the DSM-5 PTSD criteria; all as a proportion of those already with a diagnosis of PTSD. All results were characterised by high levels of heterogeneity, limiting generalisability. Moderator analyses mostly failed to identify sources of heterogeneity. PTSD-DS was more prevalent in children compared to adults, and in diagnosis-based and clinical cut-off samples compared to LCA and LPA samples. Risk of bias was not significantly related to prevalence estimates. The implications of these results are discussed further.

Keywords: Meta-Analysis; Prevalence; Stress Disorders, Post-Traumatic; Systematic Review

Introduction

In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-5; American Psychiatric Association (APA), 2013], post-traumatic stress disorder (PTSD) is classified as a trauma- and stressor-related disorder. A diagnosis is based on a required number of symptoms across domains of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Also stipulated in DSM-5 are the criteria required for specifying the dissociative subtype of PTSD (PTSD-DS) where, in addition to first meeting the criteria for PTSD diagnosis, individuals must endorse symptoms of depersonalisation and or derealisation. Depersonalisation involves "persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one's mental processes or body", whereas derealisation takes the form of "persistent or recurrent experiences of unreality of surroundings" (DSM-5, 2013, p. 272).

It has been extensively documented that persistent dissociation is linked to post-traumatic symptomology (Carlson, Dalenberg, & McDade-Montez, 2012). The Subtype Model suggests that PTSD and PTSD-DS are distinct from one another (Dalenberg & Carlson, 2012), where PTSD-DS presents with its own epidemiological features (Schiavone, Frewen, McKinnon, & Lanius, 2018). Recent evidence suggests that there may be an association between PTSD-DS and psychopathological comorbidity and childhood abuse and neglect (Steuwe, Lanius, & Frewen, 2012), adult sexual abuse (Wolf, Miller et al., 2012), and with depression, suicidal thinking, and drug overdoses (Mergler et al., 2017), despite there being a large degree of heterogeneity in the literature concerning risk factors for PTSD-DS (Hansen, Ross, & Armour, 2017). This indicates that PTSD-DS may reflect a more severe form of PTSD (Zoet, Wagenmans, van Minnen, & de Jongh, 2018), although this is not directly assessed in this present study.

One criticism of the PTSD-DS diagnosis is that the symptoms of dissociation chosen as necessary criteria to achieve a diagnosis in DSM-5 are too narrow, where it is believed that the current criteria should also include other symptoms of dissociation (Ross,

2021), following evidence that dissociative amnesia (Wolf et al., 2017), and flashbacks

(Dahal, Kumar, & Thapa, 2018; Hyland et al., 2017) are common in individuals with

PTSD. Additionally, memory disturbance, disengagement, time loss, and trance (Frewen,

Brown, Steuwe, & Lanius, 2015), gaps in awareness, re-experiencing, and sensory

misperception (Műllerová, Hansen, Contractor, Elhai, & Armour, 2016; Ross, Baník,

Dědová, Mikulášková, & Armour, 2018) are associated with PTSD-DS. However, to some

extent, these symptoms are already captured by the existing PTSD criteria.

Several methodologies have been used to determine the prevalence of PTSD-DS,

with early studies using taxometric (Waelde, Silvern, & Fairbank, 2005; Waller & Ross,

1997), and signal detection (Ginzburg et al., 2006) analyses. The prevalence of PTSD-DS

has also been described in studies where participants were selected primarily due to a

specific comorbid difficulty, such as substance abuse disorder or psychosis, using the

DSM-5 diagnostic criteria (Gidzgier et al., 2019; Mergler et al., 2017; van Minnen et al.,

2016), and in studies that assessed subsyndromal PTSD (Bennett, Modrowski, Kerig, &

Chaplo, 2015; Kerig et al., 2016; Modrowski & Kerig, 2017). Prevalence rates of PTSD-

DS have been reported in different ways; some with respect to the total number of

participants regardless of whether the sample tested had PTSD, some were only trauma-

exposed or from a community sample, whereas other prevalence rates were with respect to

those with PTSD. This makes it challenging to make comparisons between studies. Hansen

et al.'s (2017) systematic review of latent class and profile analyses (LCA and LPA

respectively) indicated that the mean prevalence of PTSD-DS was 20.4%. LCA determines

hidden groups based on the means of categorical variables, whereas LPA does the same for

continuous variables (Oberski, 2016). Both LCA and LPA are exploratory techniques that

determine underlying hidden profiles or groups of individuals from observed data who

display similar patterns of symptoms (Muthén, 2004; Oberski, 2016). The 'best' number of

groups is determined by the most appropriate model fit, and whilst there are many methods

for determining the number of classes or profiles, the two most common methods are the

Akaike information criterion and Bayesian information criterion (where lower values indicate a better fit). However, the selection of the optimal number of classes or profiles, and the qualitative naming of each group, remains subjective on the part of the researcher, which has implications for valid prevalence estimation (Hansen et al., 2017). In addition, Hansen et al. (2017) averaged the prevalence values despite dissociation being defined differently in various studies; some used the DSM-5 criteria stipulating symptoms of either depersonalisation or derealisation, and other studies assessed a wider spectrum of dissociative experiences. Finally, due to methodological constraints, there was no way of breaking down the heterogeneous nature of the population (Hansen et al., 2017).

There is a need to comprehensively systematically review studies to attempt to establish some consensus around how prevalent PTSD-DS is in children and adults. This study aimed to conduct a broad meta-analysis of data from studies investigating current PTSD-DS to reach a reliable estimate of prevalence from studies utilising various methods of prevalence estimation, furthering the systematic review of Hansen et al. (2017). The aim was to provide greater insight into the heterogeneity that is common within participants with PTSD. This might lead to the development of risk factors for this particular subtype and help the structuring of efficacious interventions. This review will be, to the authors' knowledge, the first of its kind to meta-analyse the prevalence of PTSD-DS in participants with PTSD, assessing moderators that affect PTSD-DS prevalence, and using studies utilising different methods of prevalence estimation. There is disagreement as to what symptoms of dissociation should be required as necessary criteria to achieve a diagnosis of PTSD-DS, and this review may shed further light on this debate, by comparing the prevalence rates of PTSD-DS when defined by depersonalisation and or derealisation, and when dissociation is defined more broadly (domains other than depersonalisation and or derealisation).

Method

The protocol for this review was pre-registered on PROSPERO (reference: CRD42021210902) prior to any formal review of searches.

Search Strategy

Relevant studies were identified through a systematic search of the following databases: MEDLINE (EBSCO), PsycInfo, CINAHL, Academic Search Complete, and PTSDpubs. Studies included were those published from 1st January 1980, when the Diagnostic and Statistical Manual of Mental Disorders first defined PTSD according to DSM-III (APA, 1980), and before 14th February 2021 when the searches were conducted.

The following search terms were used for each database, processing study titles and abstracts only: (posttrauma* OR post-trauma* OR "post trauma*" OR PTSD OR PTSS) AND (dissociat* OR depersonali* OR dereali*). Medical Subject Headings (MeSH), and other equivalent key words for other databases, were used for each search term: "post-traumatic stress disorder", "post-traumatic stress", "posttraumatic stress disorder", "posttraumatic stress", "post-traumatic stress disorder in children", "stress disorders, post-traumatic", "complex PTSD", "PTSD", "PTSD (DSM-III)", "PTSD (DSM-III-R)", "PTSD (DSM-IV)", "PTSD (DSM-5)", "PTSD (ICD-9)", "PTSD (ICD-10)", "PTSD (ICD-11)", "dissociation", and "depersonalization".

The reference sections of relevant systematic reviews and meta-analyses were also searched to ensure studies were not missed.

Inclusion and Exclusion Criteria

Studies were included in this review if data were presented on the point prevalence of PTSD-DS following a traumatic event. In a bid to take a broad and comprehensive approach, the prevalence of PTSD-DS was defined as the number of participants who scored above a clinical cut-off on a validated measure or who met DSM diagnostic criteria following a clinical interview or self-report measure, or who were categorised into a distinct class or profile following LCA or LPA. Dissociation was defined by

depersonalisation and or derealisation (DSM-5 criteria), and more broadly (additionally

inclusive of domains other than depersonalisation and or derealisation). Studies of

participants of all ages, any sex, and from either community or clinical samples were

included. Studies were excluded: if they were not written in English; if participants were

selected primarily due to a specific comorbid disorder; if PTSD was assessed acutely

within a month of the index trauma; if exclusively lifetime PTSD or PTSD-DS prevalence

was reported; if subsyndromal PTSD was assessed only; if dissociation was triggered via

experimental manipulation; or if studies used analyses other than LCA, LPA, diagnostic, or

clinical cut-off method to determine the prevalence of PTSD-DS. Qualitative

methodology, single case studies, reviews and meta-analyses were also excluded.

Screening, Data Extraction, Coding and Synthesis

All studies were screened, and the data extracted by the first author (WW) using a

database which indexed the information provided in Table 1. The extracted data for all

studies were reviewed by an independent researcher (AO), so as to reduce the likelihood of

error (Buscemi, Hartling, Vandermeer, Tjosvold, & Klassen, 2006). Any queries were

discussed, and agreement reached between the researchers. Wherever there was continued

disagreement, a final decision was made by the senior researcher (RM-S). Where there was

missing information, authors were contacted directly.

During data extraction, several rules were followed to ensure consistency between

studies. Articles such as Eidhof et al. (2019), Guetta et al. (2019), and Zoet et al. (2018)

used multiple measures for the assessment of PTSD, however in these cases the Clinician

Administered PTSD scale (CAPS) was prioritised as it is regarded as the gold standard for

assessing PTSD (Weathers et al., 2004). Other studies assessed multiple populations

(Hansen, Müllerová, Elklit, & Armour, 2016; Kenny, Helpingstine, Long, & Harrington,

2020; Wolf, Lunney et al., 2012), or used multiple analyses (Choi et al., 2017; 2019;

Hansen, Hyland, Armour, & Andersen, 2019), and therefore these were treated separately

in this review as individual samples. Care was taken to ensure that no dataset contributed

more than one data point in any one meta-analysis (where diagnostic and clinical cut-off samples were prioritised over LCA and LPA samples). Multiple studies investigating the same population were removed, retaining the study with the largest sample size. Many studies (Cloitre, Petkova, Wang, & Lu, 2012; Daniels, Frewen, Theberge, & Lanius, 2016; Swart, Wildschut, Fraijer, Langeland, & Smit, 2020; Tsai, Armour, Southwick, & Pietrzak, 2015) reported means and standard deviations for participant age and sex in aggregated format, rather than for the sample as a whole. For these studies, the means and standard deviations were combined (Higgins & Deeks, 2008). When absolute frequencies were not reported, these were calculated from the reported percentage prevalence. For the LCA and LPA samples, only those classed as having 'moderate' to 'severe' symptomology were deemed to meet 'caseness' for PTSD and PTSD-DS. The point prevalence of PTSD-DS was consistently calculated as a proportion of all participants with PTSD.

Quality Assessment and Risk of Bias

Two authors (WW & AO) assessed the risk-of-bias using a researcher developed tool based on the Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart Lung and Blood Institute, 2014), and modified questions from other relevant prevalence and risk factor studies (Hoy et al., 2012; Munn, Moola, Riitano, & Lisy, 2014). The quality assessment checklist (see Appendix B) consisted of five items assessing how well the population and index trauma were specified, the rate of participation, and whether objective and standard criteria were used for the assessment of PTSD and PTSD-DS. Each item used a three-point scale (0-2), and the following categorical system was used to rate the total risk-of-bias score: 0-4 high risk/low quality, 5-6 moderate risk/quality, 7-10 low risk/high quality, following the methodology used by Memarzia, Walker, and Meiser-Stedman (2021). An inter-rater reliability assessment was conducted for all ratings between the two raters (WW & AO) which indicated a good correlation on all items [intraclass correlation = 0.87, 95% confidence intervals (CI) 0.77–0.93].

Meta-Analytic Method

The meta-analysis was conducted using R (version 4.1.1) which uses the metafor package (version 3.0-2; Viechtbauer, 2010). The extracted point prevalence of PTSD-DS, as a proportion of PTSD cases, was pooled to provide a weighted estimate of the prevalence of PTSD-DS overall (with 95% CI).

A random effects model was used given the high degree of variability expected in effect size between samples as it provides a broader and more conservative 95% confidence interval around the estimate of the prevalence.

Estimates of prevalence underwent an arcsin transformation to ensure that the confidence intervals did not fall below zero for samples where the prevalence estimate was low (Barendregt, Doi, Lee, Norman, & Vos, 2013); results were then back-transformed for ease of interpretation.

Cochran's Q test (Cochran, 1954) was used to ascertain if heterogeneity within samples was significant. The I^2 statistic (Higgins & Thompson, 2002) was used to determine the percentage of total variation in sample estimates that is due to between-study heterogeneity.

Moderator analyses of prevalence estimates were conducted to ascertain if sample characteristics impacted the prevalence estimate. These characteristics included: method of PTSD-DS assessment, which DSM criteria was used, participant age group, occupation, and the type of trauma experienced. These were included as there were multiple samples that allowed for these comparisons to be made. A sensitivity analysis was used to assess the impact of risk-of-bias on the estimated pooled prevalence. This was achieved by repeating the meta-analysis, excluding those samples that constituted a high risk-of-bias. Any differences in the moderator and sensitivity analyses were tested for clinical significance by meta-analytic regression.

A funnel plot was used to assess for publication bias (Higgins & Altman, 2008), however this is less likely to occur in prevalence studies given there is no assessment of

clinical significance, and therefore it is less likely that there is a bias in levels of

acceptance to journals (Brewin, Andrews, & Valentine, 2000). The 'trim-and-fill' method

was used (Duval & Tweedie, 2000), where any missing null or weaker studies are

estimated to improve the symmetry of the sample distribution.

Results

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) diagram shows that 337 studies met the eligibility criteria following the initial

screen of titles and abstracts (Figure 1). Full text reviews were conducted again, leading to

49 studies being included in the meta-analysis. Four studies were split into two samples

due to different characteristics, index traumas or analyses, leaving 53 samples included in

this review (Table 1). Around half the samples were treatment-seeking ($k = 23$), and

PTSD-focussed (a diagnosis of PTSD was an inclusion criterion; $k = 22$). Nine samples

included only female participants, three samples included only males, and the rest were

mixed or the sex was not reported. The majority of included samples were adult ($k = 41$);

only five exclusively comprised children. Samples mostly originated from high-income

countries ($k = 49$).

Figure 1

PRISMA diagram showing the process of study identification, screening, and inclusion

Identification

Records identified through database searching **(total *n* = 9614):**
Academic Search Complete (n = 1522)
CINAHL (*n* = 808)
MEDLINE (EBSCO) (*n* = 2114)
PsycInfo (*n* = 2925)
PTSDpubs (*n* = 2245)

Additional records identified through other sources
(*n* = 1)

Screening

Records after duplicates removed
(*n* = 4684)

Records screened
(*n* = 4684)

Records excluded
(*n* = 4347)

Eligibility

Full-text articles assessed for eligibility
(*n* = 337)

Full-text articles excluded **(*n* = 288):**
PTSD-DS not assessed / prevalence not reported (*n* = 209)
PTSD not assessed / prevalence not reported (*n* = 25)
Studies using the same data (*n* = 21)
Papers not written in English (*n* = 17)
Analyses used other than LCA/LPA, diagnostic, or surpassing clinical cut-off (*n* = 4)
Lifetime PTSD assessed only (*n* = 3)
Participants recruited for comorbid condition (*n* = 3)
Subsyndromal PTSD assessment (*n* = 3)
Dissociation triggered in participants (*n* = 2)
Protocol paper (*n* = 1)

Included

Studies included in quantitative synthesis (meta-analysis)
(*n* = 49)

Note. n = number of studies

Table 1

Included sample characteristics

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (*SD*)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	N Total	PTSD	PTSD-DS
1	Abu-Rus, Thompson, Naish, Brown, and Dalenberg (2020)	USA	General population (T, P)	46%	NR	37.9 (10.3)	NR	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	345	40	16
2	Acar, Öğülmüş, and Boysan, (2019)	Turkey	Prisoners	3%	18-75	34.5 (9.9)	Adult	Diagnosis	PCL[†]; DSM-5	DES[†]; other	399	237	115
3	Armour, Elklit, Lauterbach, and Elhai (2014)	Denmark	Sexual assault and rape (T)	100%	NR	22.4 (9.4)	Both	LPA	HTQ[†]; DSM-IV	TSC[†]; other	313	226	41
4	Armour, Karstoft, and Richardson (2014)	Canada	Military veterans (T)	6%	24-93	54.0 (19.0)	Adult	LPA	CAPS; DSM-IV	CAPS; other	432	286	59
5	Blevins, Weathers, and Witte (2014)	USA	Trauma-exposed college students	67%	18-32	20.2 (1.6)	Adult	LCA	PCL-S[†]; DSM-IV	MDI[†]; DSM-5	541	206	65
6	Boysan et al. (2017)	Turkey	Psychiatric patients (T, P)	44%	NR	29.0 (9.0)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	90	30	24
7	Briere, Scott, and Weathers (2005)	USA	Trauma-exposed community	48%	NR	45.2 (16.7)	Adult	Diagnosis	DAPS[†]; DSM-IV	DAPS[†]; other	372	23	13
8	Burton, Feeny, Connell, and Zoellner (2018)	USA	Chronic PTSD (P)	76%	NR	37.4 (11.3)	Adult	LTA (expanded version of LPA)	PSS-I; DSM-IV	DES-D[†]; DSM-5	200	129	24

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (*SD*)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	Total	PTSD	PTSD-DS
9	Caroppo, Lanzotti, and Janiri (2021)	Italy	Asylum seekers (T)	48%	18-59	25.5 (5.6)	Adult	Diagnosis	SCID-I; DSM-IV	SCID-I; other	180	95	74
10	Choi et al. (2019)	USA	Trauma-exposed adolescents (T)	61%	12-16	14.5 (1.5)	Child	Diagnosis	UCLA PTSD-RI[†]; DSM-IV	TSCC-A[†]; DSM-5	3081	734	394
11	Choi et al. (2017)	USA	Trauma-exposed adolescents (T)	61%	12-16	14.5 (1.5)	Child	LCA	UCLA PTSD-RI[†]; DSM-IV	TSCC-A[†]; DSM-5	3081	1279	444
12	Cloitre et al. (2012)	USA	Childhood sexual and/or physical abuse (P)	100%	18-65	36.4 (9.4)[§]	Adult	Diagnosis	CAPS; DSM-IV	TSI[†]; other	104	104	28
13	Criswell, Sherman, and Krippner (2018)	USA	Psychiatric patients (T, P)	73%	20-65	44.0 (NR)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	30	30	13
14	Daniels et al. (2016)	Germany	Trauma-exposed community (P)	61%	23-58	38.0 (11.8)[§]	Adult	Diagnosis & clinical cut-off	CAPS; DSM-IV	CAPS; DSM-5	59	59	15
15	Dorahy et al. (2017)	Northern Ireland	Psychiatric patients (T, P)	32%	19-65[‡]	40.4 (12.4)	Adult	Diagnosis	Clinical diagnosis; NR	DES[†]; other	210	65	27
16	Durham, Byllesby, Elhai, and Wang (2020)	USA & Canada	Trauma-exposed community	63%	18-74	36.0 (12.7)	Adult	LPA	PCL[†]; DSM-5	DES-II[†]; DSM-5	360	204	51
17	Eidhof et al. (2019)	Netherlands	Trauma-exposed community (T, P)	33%	19-83	48.8 (12.1)	Adult	Diagnosis	CAPS; DSM-5	CAPS[¶]; DSM-5	320	131	31

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (SD)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	Total	PTSD	PTSD-DS
18	Frewen et al. (2015)	Canada	Probable diagnosis of PTSD (T)	71%	NR	33.1 (10.8)	Adult	LPA	PCL[†]; DSM-5	Dissociation-TRASC item list[†]; DSM-5	557	311	183
19	Frewen, Zhu, and Lanius (2019)	Canada	Community	52%	NR	36.5 (12.6)	Adult	Diagnosis	PCL[†]; DSM-5	Dissociation-TRASC item list[†]; DSM-5	418	98	41
20	Guetta et al. (2019)	USA	Military veterans (P)	16%	21-75	53.8 (11.4)	Adult	LPA	PCL, Trauma Assessment from the NSES; DSM-5	CAPS[¶]; DSM-5	209	209	31
21	Hansen, Hyland, and Armour (2016)	Denmark	Bank employees following robbery	62%	20-65	42.1 (12.5)	Adult	LCA	HTQ[†]; DSM-IV	TSC[†]; DSM-5	371	67	0
22	Hansen et al. (2019)	Denmark	Whiplash injury	62%	18-89	37.5 (13.9)	Adult	Diagnosis	HTQ[†], TSC[†]; DSM-5	TSC[†]; DSM-5	234	21	7
23	Hansen et al. (2019)	Denmark	Whiplash injury	62%	18-89	37.5 (13.9)	Adult	LCA	HTQ[†], TSC[†]; DSM-5	TSC[†]; DSM-5	234	27	0
24	Hansen, Müllerová et al. (2016)	Denmark	Whiplash injury (P)	78%	NR	43.6 (10.4)	Adult	LCA	HTQ[†], TSC[†]; DSM-5	TSC[†]; DSM-5	476	476	178
25	Hansen, Müllerová et al. (2016)	Denmark	Incest during childhood (T, P)	88%	NR	35.9 (11.0)	Adult	LCA	HTQ[†], TSC[†]; DSM-5	TSC[†]; DSM-5	311	311	139
26	Harricharan et al. (2020)	Canada	Trauma-exposed community (P)	63%	18-60[‡]	39.6 (12.5)[§]	Adult	Diagnosis & clinical cut-off	CAPS; DSM-IV & 5	CAPS; DSM-5	184	133	49

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (*SD*)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	N Total	PTSD	PTSD-DS
27	Hill et al. (2020)	USA	Trauma-exposed women (T)	100%	18-62	34.1 (13.2)	Adult	Clinical cut-off	PCL[†]; DSM-5	DSPS[†]; DSM-5	104	88	73
28	Kenny et al. (2020)	USA	Commercial sexual exploitation (T)	100%	12-18	16.6 (1.2)[‡]	Child	Diagnosis	UCLA PTSD-RI[†]; DSM-5	UCLA PTSD-RI[†]; DSM-5	56	15	11
29	Kenny et al. (2020)	USA	At risk of commercial sexual exploitation (T)	100%	12-18	15.3 (1.6)[‡]	Child	Diagnosis	UCLA PTSD-RI[†]; DSM-5	UCLA PTSD-RI[†]; DSM-5	40	3	3
30	Kim et al. (2019)	South Korea	Psychiatric patients (T, P)	64%	16-70	38.7 (12.7)	Both	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	249	249	82
31	Lebois et al. (2021)	USA	Interpersonal childhood maltreatment (T, P)	100%	18-61	34.4 (12.2)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	65	65	47
32	Li, Hasset, and Seng (2019)	USA	Pregnant women	100%	NR	NR	NR	Diagnosis	National Women's Study PTSD Module; DSM-IV	DES-T[†]; other	22	10	4
33	Mulder, Beautrais, Joyce, and Fergusson (1998)	New Zealand	Community	NR	NR	NR	Adult	Diagnosis	SCID; DSM-III	DES[†]; other	1028	9	3

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (*SD*)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	Total	PTSD	PTSD-DS
34	Müllerová et al. (2016)	USA & Canada	Trauma-exposed community	56%	NR	35.2 (11.9)	NR	LPA	PCL[†]; DSM-5	DSS[†]; other	309	215	83
35	Naish et al. (2021)	USA	Trauma-exposed community	45%	18-65	40.5 (11.8)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	100	63	31
36	Nejad et al. (2007)	Iran	Military veterans (P)	0%	NR	41.5 (5.1)	Adult	Diagnosis	Clinical diagnosis; DSM-IV	DES[†]; other	260	130	42
37	Özdemir, Celik, and Oznur (2015)	Turkey	Serving soldiers (P)	0%	NR	30.3 (5.6)	Adult	Diagnosis	SCID-I; DSM-IV	DES[†]; other	184	84	59
38	Powers et al. (2017)	USA	Trauma-exposed women	100%	18-65[‡]	39.4 (11.6)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	190	72	2
39	Putnam et al. (1996)	USA & Canada	Psychiatric patients - (T, P)	60%	NR	39.0 (NR)	Adult	Diagnosis	Clinical diagnosis; DSM-III	DES[†]; other	1566	116	54
40	Richard-Malenfant, Douglass, Higginson, Ray, and Robillard (2019)	Canada	Military veterans (P)	36%	NR	49.3 (9.3)	Adult	Diagnosis	CAPS; DSM-5	CAPS; DSM-5	14	14	6
41	Ross, Armour, Kerig, Kidwell, and Kilshaw (2020)	USA	Trauma-exposed youth in detention centres	25%	12-19	16.0 (1.3)	Child	Diagnosis	UCLA PTSD-RI[†]; DSM-5	UCLA PTSD-RI[†]; DSM-5	448	197	119

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Age Mean (SD)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	N Total	PTSD	PTSD-DS
42	Ross et al. (2018)	Slovakia	Trauma-exposed university students	83%	NR	22.7 (5.1)	Adult	LPA	PCL[†]; DSM-5	DSS[†]; other	689	308	24
43	Sierk, Manthey, Brakemeier, Walter, and Daniels (2021)	Germany	Childhood interpersonal abuse (P)	100%	NR	40.0 (9.8)	Adult	Diagnosis	CAPS; DSM-IV	DES[†], CDS-30[†], CDS-state[†], CAPS, SCID-D; other	42	42	23
44	Stein et al. (2013)	Global	Community	NR	NR	NR	Adult	Diagnosis	WHO CIDI; DSM-IV	WHO CIDI; DSM-5	25018	747	108
45	Steuwe et al. (2012)	Canada	Trauma-exposed community (T, P)	90%	NR	37.9 (9.4)	NR	Diagnosis	CAPS; DSM-IV	CAPS; DSM-5	134	134	47
46	Swart et al. (2020)	Netherlands	Psychiatric patients (T)	77%	18-68	34.2 (11.9)[§]	Adult	Diagnosis	CAPS; DSM-IV	DES[†]; DSM-5	150	84	18
47	Tsai et al. (2015)	USA	Military veterans	NR	20-94[‡]	60.8 (15.2)[§]	Adult	Diagnosis	PCL[†]; DSM-5	CAPS[†]; DSM-5	1484	64	12
48	van der Kolk et al. (1996)	USA	Psychiatric patients (T)	67%	15+	37.1 (15.0)	Both	Diagnosis	SCID & DIS PTSD modules; DSM-III	SIDES; other	395	182	149
49	Verbeck et al. (2015)	USA	Psychiatric patients (T)	49%	18-69	44.0 (10.9)	Adult	Diagnosis	CAPS; DSM-IV	TSI-2[†], DES-R[†]; other	100	47	29
50	Wolf, Lunney et al. (2012)	USA	Military veterans (P)	0%	44-74	50.6 (3.6)	Adult	LPA	CAPS; DSM-IV	CAPS; other	360	360	56

Sample No.	Sample	Location	Population/trauma type	Proportion female	Age Range	Mean (*SD*)	Age group	Method of PTSD assessment	PTSD measure; DSM	PTSD-DS measure; DSM-5/other criteria	N Total	PTSD	PTSD-DS
51	Wolf, Lunney et al. (2012)	USA	Military veterans (P)	100%	22-78	44.8 (9.4)	Adult	LPA	CAPS; DSM-IV	TSI[†]; DSM-5	284	284	85
52	Wolf, Miller et al. (2012)	USA	Military veterans & their partners	36%	21-75[‡]	51.5 (11.2)[‡]	Adult	LPA	CAPS; DSM-IV	CAPS; other	492	239	30
53	Zoet et al. (2018)	Netherlands	Psychiatric patients (T)	70%	19-63[‡]	38.2 (10.9)[§]	Adult	Clinical cut-off	CAPS; DSM-IV	CAPS[¶]; DSM-5	168	168	38

Note. SD = standard deviation, T = treatment-seeking inclusion criteria; P = diagnosis of PTSD inclusion criteria; NR = Not Reported; CAPS = Clinician Administered Post-traumatic Stress Disorder Scale; PCL = Post-traumatic Stress Disorder Checklist; DES = Dissociative Experiences Scale; LPA = latent profile analysis; HTQ = Harvard Trauma Questionnaire; TSC = Trauma Symptom Checklist; LCA = latent class analysis; PCL-S = Post-traumatic Stress Disorder Checklist Specific; MDI = Multiscale Dissociation Inventory; DAPS = Detailed Assessment of Posttraumatic Stress; DES-D = depersonalization/derealisation subscale of the DES; PSS = Post-traumatic Stress Disorder Symptom Scale; PSS-I = PTSD Symptom Scale-Interview, SCID-I = Structured Clinical Interview for the DSM-IV Axis I Disorders; UCLA PTSD-RI = University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index; TSCC-A = Trauma Symptom Checklist for Children-Alternate Version; TSI Trauma Symptom Inventory; TRASC = trauma-related altered states of consciousness; NSES = National Stressful Events Survey; DES-T = 8-item taxon version of the DES; SCID = Structured Clinical Interview for DSM; DSPS = Dissociative Subtype of PTSD Scale; DSS = Dissociative Symptoms Scale; CDS = Cambridge Depersonalization Scale; SCID-D = Structured Clinical Interview for DSM-IV Dissociative Disorders; WHO CIDI = World Health Organisation Composite International Diagnostic Interview; DIS = Diagnostic Interview Schedule; SIDES = Structured Interview for Disorders of Extreme Stress; DES-R = Dissociative Experiences Scale – Revised.

† Measure completed via self-report

‡ Information acquired via correspondence with study author(s)

§ Mean and standard deviation values combined (Higgins & Deeks, 2008)

¶ Multiple measures used, however CAPS chosen as the gold standard (Weathers et al., 2004)

Risk-of-Bias Assessment

Twelve samples were deemed to be at high risk-of-bias, 16 were moderate risk, whereas 25 were low risk (Appendix C). The proportion of samples rated as low, moderate and high risk across the five quality assessment items can be seen in Appendix D.

Prevalence

The pooled prevalence of PTSD-DS estimates and heterogeneity statistics for all samples can be seen in Table 2. The overall pooled prevalence was 38.1%. For diagnosis-based and clinical cut-off samples the pooled prevalence was 45.5%, while for latent class and profile samples the estimate was 22.8%. Meta-regression analyses indicated that the prevalence of PTSD-DS in the diagnosis-based or clinical cut-off samples was statistically significantly greater that the LCA or LPA samples (see Figure 2 for forest plot). The range of prevalence overall was 0-100%, and the degrees of between sample heterogeneity were extremely high.

Table 2

Pooled point prevalence of PTSD-DS as a proportion of those with PTSD for all samples (k = 51)

			Pooled			
Meta-analysis subgroup	**k**	**n**	**Prevalence (%)**	**95% CI**	**Q test**	**I^2**
All samples[†]	51	8214	38.1	(31.5, 45.0)	1602.0[*]	97.4
Method of PTSD-DS Assessment [β = -0.2418 (95% CI = -0.3780, -0.1056), p = 0.0005]						
Diagnosis-based/clinical cut-off	36	4383	45.5	(37.7, 53.4)	923.6[*]	96.0
LCA/LPA[†]	15	3831	22.8	(14.8, 32.0)	482.5[*]	97.6
PTSD DSM criteria used[†‡] [β = -0.0871 (95% CI = -0.2328, 0.0586), p = 0.24]						
DSM-5	24	3451	42.5	(32.4, 53.0)	624.6[*]	97.3
DSM-III or DSM-IV	25	4565	34.1	(24.9, 43.9)	936.0[*]	97.8
Dissociation criteria[†] [β = 0.0342 (95% CI = -0.1113, 0.1796), p = 0.65]						
DSM-5 (Dereal / Depers)	32	5436	36.9	(28.5, 45.8)	895.2[*]	97.6

Meta-analysis subgroup	k	n	Prevalence (%)	95% CI	Q test	I²
			Pooled			
Broader dissociation	19	2778	40.2	(29.5, 51.4)	698.3*	97.1

Dissociation measure completion[†§] [β = 0.0281 (95% CI = -0.1189, 0.18), p = 0.71]

	k	n	Prevalence (%)	95% CI	Q test	I²
Self-report	31	4997	38.8	(30.6, 47.3)	778.8*	97.2
Interview	19	3175	36.2	(24.8, 48.5)	690.4*	97.9

Age group[†¶] [β = 0.3587 (95% CI = 0.0814, 0.6360), p = 0.01]

	k	n	Prevalence (%)	95% CI	Q test	I²
Child	4	949	62.9	(39.6, 83.3)	11.4*	82.0
Adult	40	6209	35.0	(27.8, 42.6)	1121.1*	97.3

Occupation[†] [β = -0.1439 (95% CI = -0.3227, 0.0350), p = 0.11]

	k	n	Prevalence (%)	95% CI	Q test	I²
Military	9	1670	26.9	(16.2, 39.1)	138.1*	96.3
Civilian	42	6544	40.7	(33.1, 48.5)	1325.7*	97.4

Trauma type[†] [β = 0.1011 (95% CI = -0.1163, 0.3185), p = 0.36]

	k	n	Prevalence (%)	95% CI	Q test	I²
Interpersonal	6	763	46.8	(28.3, 65.7)	101.9*	95.9
Other	45	7451	37.0	(29.9, 44.3)	1494.9*	97.5

Note. k = number of samples; n = number of participants; CI = confidence interval; LCA = latent class analysis; LPA = latent profile analysis; Dereal = derealisation; Depers = depersonalisation

* p < 0.0001, where the degrees of freedom (df) = k - 1

† Samples 11 and 23 removed to avoid duplication of population samples

‡ Sample 15 removed as no PTSD DSM criteria reported, sample 26 removed as used both DSM-IV and DSM-5 when assessing for PTSD

§ Sample 43 removed as a mix of self-report and interview measures were used

¶ Several samples were removed due to populations formed of both children and adults, or age group not reported

Figure 2

Forest plot of PTSD-DS prevalence estimates grouped by PTSD-DS assessment method

Abu–Rus et al. (2020; Sample 1)	0.400 [0.255, 0.554]
Acar et al. (2019; Sample 2)	0.485 [0.422, 0.549]
Boysan et al. (2017; Sample 6)	0.800 [0.641, 0.921]
Briere et al. (2005; Sample 7)	0.565 [0.363, 0.757]
Caroppo et al. (2021; Sample 9)	0.779 [0.690, 0.856]
Choi et al. (2019; Sample 10)	0.537 [0.501, 0.573]
Cloitre et al. (2012; Sample 12)	0.269 [0.189, 0.358]
Criswell et al. (2018; Sample 13)	0.433 [0.264, 0.611]
Daniels et al. (2016; Sample 14)	0.254 [0.152, 0.372]
Dorahy et al. (2017; Sample 15)	0.415 [0.299, 0.536]
Eidhof et al. (2019; Sample 17)	0.237 [0.168, 0.313]
Frewen et al. (2019; Sample 19)	0.418 [0.323, 0.517]
Hansen et al. (2019; Sample 22)	0.333 [0.153, 0.544]
Harricharan et al. (2020; Sample 26)	0.368 [0.289, 0.452]
Hill et al. (2020; Sample 27)	0.830 [0.744, 0.900]
Kenny et al. (2020; Sample 28)	0.733 [0.490, 0.918]
Kenny et al. (2020; Sample 29)	1.000 [0.713, 1.000]
Kim et al. (2019; Sample 30)	0.329 [0.272, 0.389]
Lebois et al. (2021; Sample 31)	0.723 [0.609, 0.824]
Li et al. (2019; Sample 32)	0.400 [0.134, 0.703]
Mulder et al. (1998; Sample 33)	0.333 [0.081, 0.654]
Naish et al. (2021; Sample 35)	0.492 [0.370, 0.615]
Nejad et al. (2007; Sample 36)	0.323 [0.246, 0.406]
Özdemir et al. (2015; Sample 37)	0.702 [0.601, 0.795]
Powers et al. (2017; Sample 38)	0.028 [0.003, 0.078]
Putnam et al. (1996; Sample 39)	0.466 [0.376, 0.556]
Richard–Malenfant et al. (2019; Sample 40)	0.429 [0.191, 0.686]
Ross et al. (2020; Sample 41)	0.604 [0.535, 0.671]
Sierk et al. (2021; Sample 43)	0.548 [0.397, 0.694]
Stein et al. (2013; Sample 44)	0.145 [0.120, 0.171]
Steuwe et al. (2012; Sample 45)	0.351 [0.272, 0.433]
Swart et al. (2020; Sample 46)	0.214 [0.134, 0.308]
Tsai et al. (2015; Sample 47)	0.187 [0.102, 0.292]
van der Kolk et al. (1996; Sample 48)	0.819 [0.760, 0.871]
Verbeck et al. (2015; Sample 49)	0.617 [0.475, 0.749]
Zoet et al. (2018; Sample 53)	0.226 [0.166, 0.292]
Diagnosis/Clinical Cut–off Prevalence Estimation	0.455 [0.377, 0.534]
Armour, Elklit et al. (2014; Sample 3)	0.181 [0.134, 0.234]
Armour, Karstoft et al. (2014; Sample 4)	0.206 [0.161, 0.255]
Blevins et al. (2014; Sample 5)	0.316 [0.254, 0.381]
Burton et al. (2018; Sample 8)	0.186 [0.124, 0.258]
Durham et al. (2020; Sample 16)	0.250 [0.193, 0.312]
Frewen et al. (2015; Sample 18)	0.588 [0.533, 0.642]
Guetta et al. (2019; Sample 20)	0.148 [0.104, 0.200]
Hansen, Hyland et al. (2016; Sample 21)	0.000 [0.000, 0.014]
Hansen, Müllerová et al. (2016; Sample 24)	0.374 [0.331, 0.418]
Hansen, Müllerová et al. (2016; Sample 25)	0.447 [0.392, 0.502]
Müllerová et al. (2016; Sample 34)	0.386 [0.322, 0.452]
Ross et al. (2018; Sample 42)	0.078 [0.051, 0.110]
Wolf, Lunney et al. (2012; Sample 50)	0.156 [0.120, 0.195]
Wolf, Lunney et al. (2012; Sample 51)	0.299 [0.248, 0.354]
Wolf, Miller et al. (2012; Sample 52)	0.126 [0.087, 0.170]
Latent Class/Profile Analysis Prevalence Estimation	0.228 [0.148, 0.320]
RE Model	0.381 [0.315, 0.450]

0.000   0.200   0.400   0.600   0.800   1.000

Proportion

Note. Samples 11 and 23 removed to avoid duplication of population samples

Moderator Analyses

All Samples

Moderator analyses were conducted for all samples to assess whether the pooled prevalence estimate of PTSD-DS was associated with demographic, trauma or assessment factors (Table 2). Meta-regression analyses confirmed that the prevalence of PTSD-DS in the child samples was statistically significantly greater than the adult samples, although there were only four child samples for comparison. All other comparisons were non-significant; however, several comparisons were likely underpowered.

Diagnostic and Clinical Cut-off Samples

Further subgroup moderator analyses were conducted separately for the diagnostic and clinical cut-off samples (Table 3), regardless of the dissociation criteria used, given the significant difference in pooled prevalence estimates of PTSD-DS between these samples and those using LCA or LPA. Meta-regression analyses confirmed again that the prevalence of PTSD-DS in the child samples was statistically significantly greater than the adult samples, although there were only four child samples for comparison. All other comparisons were non-significant; however, several comparisons were likely underpowered.

Further moderator analyses were conducted for only those samples utilising DSM-5 criteria for dissociation (depersonalisation and or derealisation; see Appendix E). When only samples using DSM-5 diagnostic and clinical cut-off criteria for the assessment of PTSD and PTSD-DS were pooled, the estimated prevalence of PTSD-DS was 48.2%. This provides the most valid estimate of PTSD-DS prevalence according to the DSM-5 criteria. Meta-regression analyses confirmed again that the prevalence of PTSD-DS in the child samples was statistically significantly greater than the adult samples, although there were only four child samples for comparison. All other comparisons were non-significant; however, several comparisons were likely underpowered.

Table 3

Pooled point prevalence of PTSD-DS as a proportion of those with PTSD for all diagnostic and clinical cut-off samples (i.e., excluding LCA & LPA samples; k = 36)

Meta-analysis subgroup	*k*	*n*	(%)	95% CI	*Q* test	*I²*
				Pooled Prevalence		
PTSD DSM criteria used[†] [*β* = -0.0363 (95% CI = -0.2065, 0.1338), *p* = 0.68]						
DSM-5	17	1417	48.1	(35.0, 61.3)	288.3[*]	95.7
DSM-III or DSM-IV	17	2768	44.2	(33.6, 55.1)	623.7[*]	96.5
Dissociation criteria [*β* = 0.1135 (95% CI = -0.0471, 0.2740), *p* = 0.17]						
DSM-5 (Dereal / Depers)	23	3239	41.7	(31.5, 52.2)	622.8[*]	96.9
Broader dissociation	13	1144	52.9	(42.5, 63.3)	173.2[*]	91.4
Dissociation measure completion[‡] [*β* = 0.0479 (95% CI = -0.1171, 0.2130), *p* = 0.57]						
Self-report	20	2260	47.0	(37.8, 56.3)	233.1[*]	93.9
Interview	15	2081	42.7	(29.2, 56.8)	576.9[*]	97.3
Age group[§] [*β* = 0.2794 (95% CI = 0.0115, 0.5474), *p* = 0.04]						
Child	4	949	62.9	(50.2, 74.7)	11.4[**]	82.0
Adult	27	2819	42.1	(33.4, 51.2)	616.6[*]	95.4
Occupation [*β* = -0.0574 (95% CI = -0.3115, 0.1968), *p* = 0.66]						
Military	4	292	40.5	(19.1, 63.9)	49.8[*]	93.2
Civilian	32	4091	46.1	(37.8, 54.6)	873.7[*]	96.3
Trauma type [*β* = 0.1184 (95% CI = -0.1345, 0.3714), *p* = 0.36]						
Interpersonal only	4	226	55.9	(33.4, 77.2)	41.4[*]	90.5
Other	32	4157	44.2	(35.6, 52.6)	876.4[*]	96.3

Note. k = number of samples; *n* = number of participants; CI = confidence interval; Dereal = derealisation; Depers = depersonalisation

[*] *p* < 0.0001, where the degrees of freedom (*df*) = *k* – 1

[**] *p* < 0.01, where the degrees of freedom (*df*) = *k* – 1

† Sample 15 removed as no PTSD DSM criteria reported, sample 26 removed as used both DSM-IV and DSM-5 when assessing for PTSD

‡ Sample 43 removed as a mix of self-report and interview measures were used

§ Several samples were removed due to populations formed of both children and adults, or age group not reported

Latent Class and Profile Samples

Moderator analyses were conducted separately for the LCA and LPA samples (see Appendix F), again given the significant difference in pooled prevalence of PTSD-DS estimates between these samples and those using diagnostic and clinical cut-off methods. Meta-regression analyses confirmed that there were no statistically significant differences, however several comparisons were likely underpowered.

Sensitivity Analyses

When the 28 samples of low and moderate quality were removed, the estimated prevalence of PTSD-DS was not dissimilar to that for all samples (35.7%, 95% CI 24.8–47.3%) with a similar degree of between sample heterogeneity [$k = 25$, $Q(24) = 717.8$, $p < 0.0001$, $I^2 = 98.5\%$]. Meta-regression analyses indicated there was not a significant difference between high and low-moderate quality groups [$\beta = 0.0040$ (95% CI -0.1384, 0.1463), $p = 0.96$]. Therefore, it can be concluded that there was no support for the quality of the samples affecting the prevalence of PTSD-DS estimates.

Given the differences in prevalence in PTSD-DS between child and adult samples, the child samples were removed to assess whether similar results were achieved as in Table 2. Meta-regression analyses confirmed that the only statistically significant difference existed between the estimated prevalence of PTSD-DS for the diagnosis-based or clinical cut-off samples and LCA or LPA samples [$\beta = -0.2159$ (95% CI -0.3531, -0.0787), $p = 0.002$]. All other comparisons were non-significant (ps = 0.19–0.87), however several comparisons were likely underpowered.

Publication Bias

Visual inspection of the funnel plot (see Appendix G) suggests the distribution of samples was asymmetrical, which was confirmed by Egger's test ($p = 0.03$). However, the study of Kenny et al. (2020; sample 29) was very small and should be considered an outlier. When this sample was removed, the Egger's test confirmed the symmetry of the distribution ($p = 0.30$). No null or weaker studies were estimated as missing, indicating little to no publication bias.

Discussion

A comprehensive systematic review and meta-analysis of prevalence data from studies investigating current PTSD-DS utilising various methods of prevalence estimation was completed. The aim was to generate a reliable estimate for the prevalence of PTSD-DS and to provide greater insight into the heterogeneity in prevalence that is common within participants with PTSD-DS. The estimated pooled prevalence of PTSD-DS was: 38.1% for all samples, 45.5% for all diagnostic and clinical cut-off samples, and 22.8% for all LCA and LPA samples. The estimated prevalence of PTSD-DS from the LCA and LPA samples was similar to that found in the Hansen et al. (2017) systematic review (20.4%); this is unsurprising given nine of the 11 studies in the Hansen et al. (2017) review were also included in the present study. When only samples strictly using DSM-5 diagnostic and clinical cut-off criteria for the assessment of PTSD and PTSD-DS were pooled, the estimated prevalence of PTSD-DS was 48.1%. The prevalence of PTSD-DS may therefore be significantly greater than previously suggested.

Impact of Diagnostic and Clinical Cut-off Assessment Versus LCA and LPA on Estimated Prevalence of PTSD-DS

The estimated prevalence of PTSD-DS for the diagnostic and clinical cut-off samples was significantly higher than that of the LCA and LPA samples. Use of clinical cut-off measures may overestimate the prevalence of PTSD in adults (Richardson, Frueh, & Acierno, 2010). Moreover, it may be easier to identify individuals with PTSD who show

symptoms of depersonalisation or derealisation in a clinical interview or that surpass a

clinical cut-off on a dissociation measure, rather than via LCA and LPA methods. On the

other hand, latent class and profile analyses may rely on participants reporting multiple

significant dissociative symptoms rather than just one symptom to a significant level.

Achterhof, Huntjens, Meewisse, and Kiers (2019) questioned the use of LCA and LPA to

ascertain the prevalence of Complex PTSD and highlighted that despite the analyses

determining distinct profiles, the symptom profiles for groups of participants were very

close to one another and even overlapped on occasion. Therefore, it may be questioned

whether LCA and LPA reliably and validly estimates subtype prevalence.

Impact of Moderators on Estimated Prevalence of PTSD-DS

There was no significant difference between the estimated prevalence of PTSD-DS

when dissociation was assessed by the DSM-5 criteria (presence of either

depersonalisation or derealisation) or when defined by a broader spectrum of dissociative

symptoms. The aim of the inclusion of the PTSD-DS in DSM-5 was to define a small

subgroup of individuals with consistent clinical and epidemiological features (Miller,

Wolf, & Keane, 2014; Schiavone et al., 2018), however results from the present study

suggest a subtype where the prevalence varies widely across samples (0-100%) and where

the heterogeneity could not be broken down following moderator analyses. Research

literature suggests that the symptomology of PTSD is itself heterogeneous (Elhai, Frueh,

Davis, Jacobs, & Hamner, 2003; Galatzer-Levy & Bryant, 2013; Naifeh, Richardson, Del

Ben, & Elhai, 2010), where dissociation is one such symptom that can vary.

The estimated prevalence of PTSD-DS was significantly higher for samples of

children compared to adults, although there were limited number of samples investigating

exclusively children, and the results were dominated by that of Choi et al. (2019; sample

10). There was no one trauma type that best categorised the child samples. Research has

shown that dissociation is a common experience for children, that later becomes less

prevalent with child development and the transition into adulthood (Brunner, Parzar,

Schuld, & Resch, 2000; Choi et al., 2017; Coons, 1996; Shimizu & Sakamoto, 1986). Choi et al. (2019) reported that 53.7% of children with PTSD had the dissociative subtype; a prevalence much higher than in many other adult samples, and the authors cited the prominence of dissociation as a form of coping in response to maltreatment in childhood (Liotti, 2004). Children may be more susceptible to PTSD-DS because they do not have the same capacity to avoid cues relating to the traumatic event, especially when the trauma was based within the home environment, or with a primary caregiver (Choi et al., 2019). In children, dissociation may offer an alternative method of escape to reduce distress. It might also be considered whether depersonalisation and derealisation are the most appropriate symptoms by which to assess for PTSD-DS in children. The premise of the Subtype Model is that these dissociative symptoms are rare (Lanius et al., 2014), however it may be that dissociative experiences are more common in youth (Carlson, Yates, & Sroufe, 2009) and may not even be considered as pathological. Further research is required within this area to determine whether children are more at risk from dissociation in the context of PTSD compared to adults, as the lack of power within the samples of children frustrated the moderator analyses.

Other than age group, all other moderator analyses yielded non-significant results indicating no support for any differences between estimated prevalence of PTSD-DS. This is surprising given the extant research on mediators and risk factors in relation to PTSD-DS (Hansen et al., 2017; Schiavone et al., 2018 for review), but these non-significant results are likely to reflect the heterogeneity between these samples and the lack of power in some moderator analyses.

It is important to stress that the pooled prevalence estimates were characterised by a high degree of heterogeneity throughout, and inspection of the forest plot (Figure 2) shows how varied the prevalence of PTSD-DS is across different samples. This is not unexpected given the multiple ways of assessing and conceptualising PTSD-DS, however subsequent sensitivity and moderation analyses failed to reduce the level of heterogeneity. This

therefore limits the generalisability of the findings. The consistently high level of prevalence heterogeneity may reflect the difficulty in conceptualising and defining a construct such as dissociation in the context of PTSD. Even when only samples adhering to the strict DSM-5 criteria for PTSD-DS were pooled, a high degree of heterogeneity remained.

Clinical Implications and Suggestions for Future Research

This meta-analysis suggests that PTSD-DS is common in children and adults with PTSD, and therefore should be routinely assessed for and formulated in the form of additional questions and information around symptoms of derealisation, depersonalisation, and other dissociative symptomology, especially if the DSM-5 framework is used. Clinicians supporting individuals with PTSD should be aware that dissociation is a prevalent and important feature of the overall presentation of PTSD; this may be especially true for children, though this finding was based on only five samples. When the DSM-5 criteria were published it was believed that PTSD-DS cases formed a minority of those with PTSD, however the finding that nearly half of PTSD cases meet the criteria for PTSD-DS suggests that it may be less of a subtype and that dissociation forms a central component to PTSD symptomology. This should be a consideration for how dissociation is specified in future versions of the DSM. Whilst Hoeboer et al. (2020) indicated that there was no evidence to suggest that dissociation impacts the efficacy of PTSD psychotherapy, evidence may highlight that different treatment options are appropriate for dissociative symptoms in the context of PTSD as defined by the DSM in the future. Perhaps the conceptualisation of Complex PTSD as defined by the 11th revision of the International Classification of Diseases (World Health Organisation, 2019), where dissociation is stipulated as one of several symptoms seen to be indicative of a more complex form of PTSD, is a more appropriate fit. There is evidence for instance that individuals with Complex PTSD have elevated levels of dissociation (Hyland, Shevlin, Fyvie, Cloitre, & Karatzias, 2019).

Despite the DSM-5 criteria stipulating depersonalisation and derealisation as symptoms required for PTSD-DS, findings of this review suggested that when a wider view of dissociation (i.e., drawing on a broader range of dissociation symptoms) is included in the criteria, PTSD-DS prevalence does not change significantly. No conclusions can be drawn as to whether it would be more or less appropriate for a narrower (i.e., solely based on depersonalisation and or derealisation) or a broader definition of dissociation, in the context of this subtype, to be used in future versions of diagnostic criteria. However, it does not seem to matter how dissociation is defined when determining the prevalence of PTSD-DS, which raises questions firstly about the strict nature of the DSM criteria when defining this subtype (Ross, 2021), and secondly about the existence of this subtype full stop. Further research is required to establish if there are particular risk factors, and whether PTSD-DS could be indicative of a distinct form of PTSD that has its own clinical characteristics, and therefore break down the prevalence heterogeneity common to populations with the subtype. This would help inform exactly how dissociation should be integrated into future diagnostic criteria of PTSD. Perhaps as Ross (2021) suggests, future diagnostic criteria could stipulate the requirement for the presence of one or more of: depersonalisation, derealisation, dissociative amnesia, and dissociative flashbacks. Non-dissociative PTSD may then form the subtype based on a minority of cases, and dissociative PTSD may form the majority of diagnosed cases.

The method for determining PTSD-DS was found to have important implications for the estimated prevalence, where samples using diagnostic and clinical cut-off methods reported a higher prevalence than those using LCA and LPA. Future research should aim to standardise the methodology used to identify and determine PTSD-DS in order to make more valid comparisons between studies.

Limitations

There are several limitations that should be considered for this review. Firstly, whilst many more studies were reviewed in comparison to the most recent systematic

review (Hansen et al., 2017), there was still a considerable degree of heterogeneity between samples, reducing the generalisability of the findings. This raises questions around the validity of the underlying diagnostic subtype. Secondly, most studies were conducted in high income countries, and all studies were exclusively written in English, therefore indicating that the results are likely not globally generalisable. Thirdly, some moderator analyses lacked power and further planned moderator analyses were not possible due to a lack of identified studies. Understanding the influence of, for instance, sex, time between index trauma and PTSD assessment, single- versus multi-event traumas, and individual versus collective trauma could lead to important and interesting findings. Finally, several studies chose to assess PTSD-DS with regard to the most recent trauma that the participant was exposed to, and it is unclear whether other traumas may have taken place, and what impact these may have on the prevalence of PTSD-DS.

Conclusion

This study is the first to meta-analyse data on the point prevalence of PTSD-DS. The estimated prevalence of PTSD-DS, with respect to participants diagnosed with PTSD, was 38.1% (95% CI 31.5 – 45.0%) for all samples, 45.5% (95% CI 37.7 – 53.4%) for all diagnosis-based and clinical cut-off samples, 22.8% (95% CI 14.8 – 32.0%) for all LCA and LPA samples, and 48.1% (95% CI 35.0 – 61.3%) for diagnosis-based and clinical cut-off samples which assessed PTSD and PTSD-DS strictly according to the DSM-5 criteria. The prevalence of PTSD-DS was significantly higher for children compared to adults. Factors such as the DSM criteria used for the assessment of both PTSD and dissociation, whether the dissociation assessment was self-report or interview, and participant or trauma characteristics, did not significantly affect the estimated prevalence of PTSD-DS. However, all results were characterised by very high levels of heterogeneity. Further research is required to investigate this construct, and to determine how it should be best conceptualised in future editions of the diagnostic criteria.

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Chapter 3. Bridging Chapter

The systematic review outlined in Chapter 2 provided an overview of the available evidence concerning the point prevalence of the dissociative subtype of post-traumatic stress disorder (PTSD-DS) in both children and adults, relative to those with PTSD. The evidence presented is a significant addition to the research literature, following the systematic review by Hansen et al. (2017) which focussed purely on latent class and profile analyses (LCA and LPA respectively). The systematic review presented in Chapter 2 is therefore the first study to include a comprehensive and broad meta-analysis of prevalence of PTSD-DS by pooling empirical evidence utilising different methods of prevalence estimation.

Estimated point prevalence of PTSD-DS, as a proportion of PTSD cases, was 38.1% (95% CI 31.5-45.0%) when all studies were included in the meta-analysis, 45.5% (95% CI 37.7 – 53.4%) for all studies where the prevalence was determined by diagnostic and clinical cut-off methods, and 22.8% (95% CI 14.8 – 32.0%) for all LCA and LPA samples. The estimated prevalence of PTSD-DS for the diagnostic and clinical cut-off samples was significantly higher than that of the LCA and LPA samples [β = -0.2418 (95% CI = -0.3780, -0.1056), p = 0.0005], raising the question whether these latter analyses validly and reliably determine the prevalence of PTSD-DS. Estimated prevalence was 48.1% (95% CI 35.0-61.3%) when diagnosis and clinical cut-off methods were used to define PTSD and PTSD-DS according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria, in which one or both symptoms of depersonalisation and derealisation are required [American Psychiatric Association (APA), 2013].

The estimated prevalence of PTSD-DS was significantly higher for the studies sampling children compared to adults, which might suggest that PTSD-DS is more common in children, or that the criteria for PTSD-DS are overly sensitive to this presentation in children, relative to adults. All other moderator analyses indicated no

significant differences in prevalence of PTSD-DS, including whether dissociation was measured via self-report or interview, and whether participants had experienced an interpersonal trauma or not. The results of the meta-analysis were characterised throughout by a high degree of heterogeneity where prevalence rates varied significantly between studies, and the results of sensitivity and moderation analyses failed to reduce the level of prevalence heterogeneity. It was therefore concluded that PTSD-DS is an elusive construct to determine with respect to prevalence.

Whilst the systematic review offers evidence that PTSD-DS is relatively common in those with PTSD, our understanding of this subtype remains poor. One of the first major gaps in the literature concerns studies investigating PTSD-DS in children. Given the systematic review identified that the prevalence of PTSD-DS may be significantly higher in children compared to adults (albeit the comparisons were underpowered), there is good reason to conduct further research to ascertain the prevalence of the subtype in children. There is disagreement in the literature as to which aspects of dissociation should be considered typical and which should be considered pathological across development (Hornstein & Putnam, 1992; Putnam, 2000; Silberg & Dallam, 2009). For example, having an imaginary friend or daydreaming might be deemed a form of developmentally appropriate dissociation in childhood. Whilst PTSD is commonly misdiagnosed in childhood, dissociation is reported to be misdiagnosed to an even greater degree (Berenson, 1998; Choi et al., 2019). It is therefore important to develop a more robust evidence base surrounding PTSD-DS in children.

Secondly, much of the research into PTSD-DS has involved samples of children who have experienced single-event trauma only (Bennett et al., 2015), neglecting other forms of trauma such as abuse and chronic maltreatment. Suliman et al. (2009) demonstrated that there was a linear relationship between the number of traumas and an increase in PTSD symptoms in children. Additionally, there is an association between dissociation and trauma severity and frequency (Carlson et al., 2012; Ford, 2013;

Schimmenti & Caretti, 2016; Trickett et al., 2011), where cumulative childhood chronic maltreatment is associated with more complex PTSD symptomology including dissociation (Bernier et al., 2013; Hagenaars et al. 2011; Herman, 1992; van der Kolk et al., 2009). Furthermore, it is thought that levels of post-traumatic dissociation are higher in children who have suffered prolonged interpersonal traumas (such as sexual and physical abuse instigated by caregivers; Bennett et al., 2014; Kerig et al., 2009; Kerig & Becker, 2015). Therefore, it would be pertinent to explore key differences in the presentation of PTSD-DS in children following both single- and multi-event trauma.

Thirdly, whilst there has been a focus in the literature on the cognitive mechanisms that might maintain PTSD symptomology in children (Bryant et al., 2007; Dalgleish et al., 2005; Hiller et al., 2019; Hiller et al., 2021; Meiser-Stedman et al., 2019; Mitchell et al., 2017; Salmond et al., 2011; Stallard & Smith; 2007) following the cognitive theory of PTSD (Brewin et al, 1996; Dalgleish, 2004; Ehlers & Clark, 2000), no studies exist to the author's knowledge that have investigated these constructs in the context of PTSD-DS. Investigating cognitive mechanisms as well as demographic, trauma, psychopathology and functional impairment factors may elucidate processes that maintain PTSD-DS in children.

Fourthly, it has been questioned whether PTSD-DS is a more severe form of PTSD, and therefore whether it is more difficult to treat effectively (Dalenberg & Carlson, 2012; Dorahy & van der Hart, 2015). It has been suggested that treatments should be altered for those experiencing dissociation symptoms alongside PTSD (Lanius et al., 2010) and that around half of clinicians feel that dissociation is a barrier to PTSD treatment (Becker et al., 2004; Ronconi et al., 2014). However, two systematic reviews highlighted that individuals with PTSD and dissociative symptoms can benefit from trauma-focussed treatments as they often reduce both the trauma related and dissociation symptoms (Atchley & Bedford, 2021), and furthermore that pre-treatment dissociation has no bearing on treatment efficacy in patients with PTSD (Hoeboer et al., 2020). It would be important then to investigate the

degree to which concurrent PTSD and dissociation more generally implicate greater PTSD severity and functional impairment in children.

Finally, the systematic review (Chapter 2) highlighted how widespread the heterogeneity was with regard to estimates of prevalence of PTSD-DS, but also the literature review process for the empirical paper (Chapter 4) highlighted how there was little consensus with regard to which correlates and risk factors are associated with the subtype. Reviews by Hansen et al. (2017) and Schiavone et al. (2018) indicate a lack of agreement across a range of different variables, which only adds to the confusing picture. These reviews indicated that variables such as age, sex, ethnicity, prior traumatic exposure, other aspects of mental health such as anxiety and depression, childhood and sexual abuse were risk factors and covariates related to PTSD-DS (Hansen et al., 2017; Schiavone et al., 2018), although these were predominantly in adult studies. It was hoped that by reaching a pooled estimate of the prevalence of PTSD-DS in the meta-analysis in Chapter 2, the degree of prevalence heterogeneity between studies would be reduce following moderator analyses. However, this was not the case and a confusing picture emerged regarding the moderator factors for this subtype. The high degree of heterogeneity found throughout may reflect the difficulty in conceptualising and defining a construct such as dissociation in the context of PTSD. Further investigation into what factors are associated with PTSD-DS may therefore make a valuable contribution to the literature.

In a bid to address some of these aims and questions, a valuable opportunity arose to analyse data from two pre-existing studies which recruited large samples of children. The two studies investigated children who had experiences of single-event trauma following presentation at one of four emergency departments in the East of England [Acute Stress Programme for Children and Teenagers study (ASPECTS); Meiser-Stedman et al., 2017], and experiences of multi-event trauma who were in the care of a nonbiological foster carer, in kinship care, or resided in residential care homes across three local authorities in England [Coping in Care After Trauma study (C-CATS); Hiller et al., 2021].

In the single-event trauma study (ASPECTS), children completed both self-report and semi-structured interview measures at two- and nine-weeks post-trauma, providing the opportunity for both cross-sectional and longitudinal analyses. In the multi-event trauma study (C-CATS), children completed self-report measures only at baseline, six-month, and 12-month follow-up, again providing the opportunity for both cross-sectional and longitudinal analyses. Initial screening and evaluation of measures used in both studies afforded the opportunity to source data and plan analyses to address previously neglected areas of research (prevalence, course, diagnostic predictive value, predictive ability with regard to post traumatic stress symptoms and functional impairment, and characteristics, all with regard to PTSD-DS in children). There was commonality in some of the outcome measures used between the single- and multi-event trauma studies, which made data analysis planning and operationalisation easier. Use of both datasets allowed for valuable comparisons to be made between demographically similar children who have experienced single- and multi-event trauma. It was aimed to build upon the existing understanding of PTSD-DS and the work undertaken in the systematic review conducted in Chapter 2, to investigate PTSD-DS in two samples of children following different forms of traumatic exposure and make a valued contribution to the research.

Chapter 4. Empirical Paper

Investigating the Dissociative Subtype of Post-Traumatic Stress Disorder in Single- and Multi-Event Trauma-Exposed Youth: Prevalence, Course, Prognosis, Severity, Functional Impairment, and Characteristics

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Abbreviated title: Investigating dissociative subtype of PTSD in trauma-exposed youth

Chapter written according to the author guidelines stipulated by the *British Journal of Clinical Psychology* (Appendix H)

Abstract

Objectives: Investigation of the dissociative subtype of post-traumatic stress disorder (PTSD-DS) has primarily focused on adults. This study aimed, following both single- and multi-event trauma, to ascertain point prevalence and course of PTSD-DS in children and adolescents; how well early PTSD-DS predicts later PTSD; whether dissociation accounts for unique variance in post-traumatic stress symptoms (PTSS) and functional impairment over and above the effect of other post-trauma cognitive processing factors and PTSS; and whether PTSD-DS is associated with risk or maintenance factors relative to its non-dissociative form. **Methods**: This study is a secondary analysis of data from the Acute Stress Programme for Children and Teenagers study (Meiser-Stedman et al., 2017), and the Coping in Care After Trauma study (Hiller et al., 2021), in which children had experienced single- and multi-event trauma respectively. **Results**: PTSD-DS diagnosis was common in children with PTSD regardless of trauma experienced (>40.0%). PTSD-DS showed a similar trajectory of natural recovery to PTSD, and it was similarly predictive of later PTSD following single-event trauma. Finally following both single- and multi-event trauma, dissociation did not appear to be a significant factor in PTSS or functional impairment. PTSD-DS was associated with sex and cognitive processing factors, although group comparisons were frustrated by small sample sizes. **Conclusions**: PTSD-DS may offer little clinical utility to the extant PTSD diagnosis in children and adolescents. Further investigation and research, over longer time periods, is warranted into PTSD-DS in children following both single- and multi-event trauma.

Keywords: Stress Disorders, Post-Traumatic; Prevalence; Prognosis; Risk Factors

Introduction

Single- and multi-event traumatic exposure in youth is common (Copeland et al., 2007), where the former follows a discrete incident, whereas the latter follows a prolonged period of maltreatment, abuse or exposure to violence. Furthermore, around 16% of children exposed to trauma develop post-traumatic stress disorder (PTSD; Alisic et al., 2014). PTSD is characterised in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by four core symptom clusters: intrusions such as nightmares or flashbacks; avoidance of thoughts or feelings related to the trauma; negative alterations in cognitions and mood; and alterations in arousal and reactivity [American Psychiatric Association (APA), 2013]. The DSM-5 also defines a dissociative subtype of PTSD (PTSD-DS) where, in addition to meeting the criteria for PTSD, individuals must demonstrate symptoms of depersonalisation and or derealisation. Depersonalisation encompasses "persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one's mental processes or body", whereas derealisation entails "persistent or recurrent experiences of unreality of surroundings" (DSM-5, 2013, p. 272). It is important to consider both single- and multi-event trauma in the context of PTSD-DS, as cumulative childhood chronic maltreatment is associated with more complex PTSD symptomology and dissociation (Bernier et al., 2013; Hagenaars et al. 2011; van der Kolk et al., 2009). To date, investigation of PTSD-DS has mostly been conducted in adults, and our understanding of this subtype in children and adolescents has largely been neglected. This is problematic, as dissociative symptoms may be more common during childhood and disagreement exists as to which domains of dissociation are pathological across development (Silberg & Dallam, 2009). It is therefore important to develop a more robust evidence base surrounding PTSD-DS in children and young people following various forms of trauma.

Both studies investigating adolescents in the juvenile justice system (Bennett et al., 2015; Kerig et al., 2016; Modrowski & Kerig, 2017) and a recent meta-analysis (White et

al., in press) suggest that the prevalence of PTSD-DS is higher in children than adults, and that levels of post-traumatic dissociation are higher in children who have suffered prolonged interpersonal trauma (such as sexual and physical abuse instigated by caregivers). The relatively high prevalence in children appears incongruous with the premise that PTSD-DS occurs in a small proportion of individuals with PTSD (Lanius et al., 2012). The point prevalence of this relatively new subtype of PTSD therefore warrants further investigation, in addition to understanding the course and natural progression of PTSD-DS over time. There is evidence that significant natural recovery in PTSD occurs for children during the first few months after single-event trauma (Hiller et al., 2016; Meiser-Stedman et al., 2017). In adults, the frequency of dissociative experiences also reduces over time following a traumatic experience (Carlson et al., 2012), correlating with natural reduction of post-traumatic stress symptoms (PTSS; Blanchard et al., 1996; Riggs et al., 1995; Rothbaum et al., 1992). However, this needs to be examined in populations of children, as the prevalence of PTSD-DS may similarly reduce over time in children as natural recovery occurs.

The Mediation Model of dissociation described by Dalenberg and Carlson (2012) suggests that dissociation could be a prerequisite for PTSD and may be a clinical marker for a more severe pathology (Lanius et al., 2012; Stein et al., 2013; Wolf et al., 2012). Associations between dissociation and PTSS have been reported (Bennett et al., 2015; Kadak et al., 2013), and dissociation and PTSS follow a similar pattern following treatment (Carlson et al., 2012). Finally, PTSD can significantly impair day-to-day functioning (APA, 2013) and dissociation in the context of PTSD may be associated with greater functional impairment (Boyd et al., 2018; 2020; Evren et al., 2011; Stein et al., 2013). There is therefore a need to evaluate whether a diagnosis of PTSD-DS is more predictive of PTSD longitudinally than a diagnosis of PTSD, and whether persistent dissociation is associated with greater PTSS and functional impairment in children.

Although evidence of risk factors for PTSD-DS in children and young people is limited, associations with PTSS, female sex, experience of sexual abuse, and frequency of traumatic events have been described (Bennett et al., 2015; Choi et al., 2019; Hagan et al., 2018). Within the broader child and adolescent field, PTSD has been associated with a wide variety of factors, including but not limited to threat to life, female sex, time since trauma, trauma severity, comorbid psychopathology, distraction, and thought suppression (Cox et al., 2008; Trickey et al., 2012). Recently, numerous groups have found that different types of cognitive processing post-trauma are associated with the maintenance of PTSD, including negative trauma-related appraisals, data-driven processing, memory quality relating to the trauma, and rumination (Hiller et al., 2019; Hiller et al., 2021; McKinnon et al., 2008; Meiser-Stedman et al., 2019; Mitchell et al., 2017). This emerging evidence base is consistent with the Ehlers and Clark (2000) cognitive model of PTSD. This model posits three core psychological processes that maintain PTSS: negative appraisals about the trauma regarding self and the world, disjointed and disorganised memories of the trauma that are rich with emotional and sensory aspects but lacking in semantic and contextual information (Hiller et al., 2021), and maladaptive forms of coping, such as cognitive avoidance and thought suppression. Further investigation of risk factors for development and maintenance of PTSD-DS in children and young people is needed.

This study sought to address the lack of research into child and adolescent PTSD-DS using evidence from children exposed to both single- and multi-event trauma. First, it was sought to ascertain the point prevalence of PTSD-DS following both single- (i.e., where a clear traumatic stressor and the time since the stressor can be identified) and multi-event trauma. Secondly, the aim was to determine the course of PTSD-DS in the first months following single-event trauma. Third, it was sought to investigate how well early PTSD-DS predicts later PTSD following single-event trauma, to ascertain if PTSD-DS may be an early indicator of a more severe PTSD in general. Given the lack of understanding around the impact of PTSD-DS in youth, a fourth aim was to investigate

whether dissociation accounted for unique variance in PTSS over and above the effect of

other post-trauma cognitive processing factors and accounted for unique variance in

functional impairment over and above the effect of PTSS, both following single- and

multi-event trauma. Finally, it was aimed to conduct an exploratory investigation of

whether PTSD-DS, non-dissociative PTSD (PTSD-ND) and no diagnosis groups differed

in demographic, trauma, psychopathology, post-trauma cognitive processing, and

functional impairment variables in youth exposed to single-, multi-event, and mixed

trauma, to ascertain if there are key risk or maintenance factors that can be identified.

Similar measures were used in both the single- and multi-event studies, which allowed for

direct comparisons to be made and for the merging of the single- and multi-event trauma

samples for these latter analyses.

Method

This study took the form of a secondary analysis of data from a prospective

longitudinal study of youth attending an Emergency Department following single-event

traumas [Acute Stress Programme for Children and Teenagers study (ASPECTS); Meiser-

Stedman et al., 2017], and from a longitudinal study of children in care [Coping in Care

After Trauma study (C-CATS); Hiller et al., 2021]. Please see these studies for full

methodologies.

Participants

ASPECTS

The first part of the analysis longitudinally investigated children who had

experienced a single-event trauma and completed an assessment around two-weeks ($n =$

226) and nine-weeks ($n = 208$) post-trauma. The second part of the analysis investigated

children who completed the Children's PTSD Symptom Scale (CPSS) at the nine-week

assessment regardless of measure completion at the two-week assessment ($n = 234$; see

Appendix I for sample trauma and demographic information). There were no significant

differences between children that did or did not complete the CPSS at nine-weeks in terms

of age, sex, ethnicity, days since trauma, or PTSS (as measured by CPSS at two-weeks; all

ps > 0.07).

C-CATS

Hiller et al. (2021) reported longitudinal data focusing on children who had been

removed from their family home and were under the care of a local authority. All had past

experience of abuse or neglect and were in the care of a nonbiological foster carer, kinship

care, or residential care homes (n = 110; see Appendix I for sample trauma and

demographic information). Only baseline assessment information was used in this study

because the longitudinal elements of the current research focussed on course and predictive

ability based on clinical interview data, and the Hiller et al. (2021) study exclusively used

child- and carer-report questionnaires to assess for PTSD and PTSD-DS. Whilst the Hiller

et al. (2021) study included 120 participants, data were missing from ten children, and

these were set aside from the analysis. There were no differences between children who

did or did not have missing data at baseline in terms of sex, ethnicity, and numbers of days

since trauma (all ps > 0.28). Children were more likely to be older in the missing data

group compared to the complete data group (p = 0.005).

Measures

Unless otherwise specified, all measures were child self-reported.

ASPECTS

The Children's PTSD Inventory (CPTSDI; Saigh et al., 2000) is a structured

interview assessing for DSM-IV PTSD (APA, 1994). Additional items were used to

diagnose DSM-5 PTSD (Appendix J).

The Children's PTSD Symptom Scale (CPSS; Foa et al., 2001) assesses PTSS

mapping onto the DSM-IV diagnostic criteria for PTSD (APA, 1994). Additional items

were added to account for new symptoms in DSM-5, and for persistent dissociation where

items indexed the domains of emotional numbness, reduced awareness of surroundings,

depersonalisation, and derealisation (Meiser-Stedman et al., 2019; Appendix K). In

addition to providing a PTSS score, a 'probable PTSD' diagnosis was derived from the CPSS if the required number of symptoms were met according to DSM-5 criteria; a symptom was deemed present if it was demonstrated at least "2 to 4 times a week/half the week". The two items indexing depersonalisation and derealisation were used to derive a 'probable PTSD-DS' diagnosis.

Anxiety was assessed via the Spence Child Anxiety Scale (SCAS; Spence, 1998), and depression by the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995).

The Trauma Memory Quality Questionnaire (TMQQ; Meiser-Stedman et al., 2007) was used to assess trauma memory characteristics, referring to visual quality, non-visual sensory qualities, temporal context, and degree to which the memory was in a verbally accessible format. The items were designed to focus on the memory quality, rather than the frequency of memories (Meiser-Stedman et al., 2007).

The Children's Post-Traumatic Cognitions Inventory (CPTCI; Meiser-Stedman et al., 2009) was used to assess negative trauma-related maladaptive appraisals. The CPTCI is based on the adult Post-Traumatic Cognitions Inventory (Foa et al., 1999) where items were adapted to be suitable for children. Additional items were added focussing on negative appraisals of traumatic stress symptoms following research investigating cognitive models of PTSD (Steil & Ehlers, 2000).

Self-blame was assessed by a novel two-item scale (Meiser-Stedman et al., 2019; Appendix L) focusing on the extent to which a child felt responsible for the event, and that it was their fault.

Functional impairment was measured by relevant items on the CPSS, i.e., did they endorse ("yes" or "no") on a list of six areas of their life (i.e., "fun and hobby activities", "relationships with your friends", "schoolwork", "relationship with your family", "chores and duties at home", and "general happiness with your life"). A continuous impairment score was formed by summing the number of "yes" answers (range 0-6).

C-CATS

The Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017) assesses PTSS mapping onto the DSM-5 diagnostic criteria for PTSD (APA, 2013). A 'probable PTSD' diagnosis was derived from the CATS if the required number of symptoms were met according to the DSM-5 criteria, a symptom deemed present if it was demonstrated at least "half the time". Depersonalisation and derealisation were measured via the same two items used in the single-event trauma study (i.e., CPSS; ASPECTS), however items in the multi-event trauma study (C-CATS) were phrased in the first person and each item rated on a subtly different scale (Appendix M).

Anxiety and depression were measured via the Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012).

The same measures were used as in the single-event trauma study (ASPECTS) to assess post-trauma cognitive processing (i.e., the TMQQ, CPTCI, and the self-blame items).

Functional impairment was measured by relevant items on the CATS, i.e., was there interference ("yes" or "no") with a list of five areas of their life (i.e., "getting along with others", "hobbies/fun", "school or work", "family relationships", and "general happiness"). A continuous impairment score was formed by summing the number of "yes" answers (range 0-5).

Procedure

Approval for ASPECTS was given by the UK National Research Ethics Service, Cambridgeshire 1 Research Ethics Committee (10/H0304/11). Approval for C-CATS was given by the University of Bath and Social-Care Research Ethics Committees (16/IEC08/0025), and additionally by participating Local Authorities.

Statistical Analyses

The first part of the data analysis centred around investigating the point prevalence of current (not lifetime) PTSD-DS in both single and multi-event trauma samples

(ASPECTS & C-CATS). Both absolute and relative prevalence statistics were reported for

PTSD-DS, the former being the proportion of participants with PTSD-DS within the

sample, and the latter the proportion of participants with PTSD that have PTSD-DS.

Following on from prevalence, the course and predictive value of PTSD-DS were

investigated longitudinally between two- and nine-weeks post-trauma, using the frequency

of diagnoses as determined by structured interview (i.e., the CPTSDI), using the single-

event trauma dataset (ASPECTS). The predictive ability of PTSD-DS at two-week

assessment was compared to that of PTSD using positive and negative predictive values,

sensitivity and specificity statistics, and logistic regression modelling. To make a valid

comparison between two- and nine-week assessments, a diagnosis of 'two-week PTSD'

ignored the duration Criterion F (APA, 2013; Brewin et al., 2003; Meiser-Stedman et al.,

2005).

The second part of the analysis involved hierarchical regression modelling, using

both single- and multi-event trauma data, which was used to assess the predictive ability of

dissociation on PTSS over and above other post-trauma cognitive processing factors, and

the predictive ability of dissociation on functional impairment over and above PTSS.

Scatterplots were used to visualise the relationship between independent and dependant

variables. Assumption of multivariate normality was supported by checking residuals were

normally distributed. Due to evidence of heteroscedasticity, nonparametric adjustments

were made using bootstrapping (Chernick, 2008), where 2000 re-samples were used. There

was no evidence of multicollinearity (no tolerance statistics < 0.259, no variance inflation

factors > 3.865), following inspection of the collinearity statistics for each model.

Finally, a cross-sectional exploratory comparison was conducted between PTSD-

DS, PTSD-ND and no diagnosis groups. Data from ASPECTS (nine weeks post-trauma)

and C-CATS (baseline) studies were used both independently and when the data was

combined to create a 'mixed' trauma sample (for variables where the same outcome

measure was used between studies). To make comparisons between the single- and multi-

event trauma studies, and in order to combine the data to form a mixed trauma dataset,

'probable PTSD-ND/PTSD-DS' diagnoses were determined by self-report measures only

(CPSS, CATS, and CPSS dissociation items). Due to the skewed nature of the data, non-

parametric (Kruskal-Wallis *H*) tests were used for between-group comparisons, regarding

demographic, trauma, psychopathology, post-trauma cognitive processing, and functional

impairment factors. Mann-Whitney *U* tests (with *p* values adjusted for multiple

comparisons via the Holm-Bonferroni method) were used to ascertain any significant

differences. Chi-squared tests were used to make comparisons between categorical data;

inspection of residuals indicated where significant differences could be found, again

adjusting for multiple comparisons. A power test confirmed two-tailed between-group

comparisons between diagnostic groups were not adequately powered to detect even a

large effect (Cohen's $D = 0.8$; $\alpha = 0.05$, achieved power 33.0-66.0%). Effect sizes for all

comparisons were calculated (Appendix N). Non-statistically significant comparisons

yielded medium to large effect sizes, suggesting a lack of power that may have skewed the

findings.

Results

Prevalence

The prevalence of PTSD and PTSD-DS at two- and nine-weeks following single-

event trauma (ASPECTS) are presented in Table 4. The relative prevalence of PTSD-DS

as a proportion of those with PTSD was 45.0% [8.2% absolute prevalence (the proportion

of those who were exposed to trauma)] at baseline following multi-event trauma in the C-

CATS study (based on self-report rather than diagnostic structured interview).

Course

Absolute prevalence (the proportion of those who were exposed to trauma) of both

PTSD and PTSD-DS approximately halved from two- to nine- weeks post-trauma, whereas

relative prevalence of PTSD-DS as a proportion of those with PTSD remained similar over

time (39.0% and 40.0% respectively; see Table 4).

Table 4

PTSD and PTSD-DS point prevalence at two- and nine-weeks following single-event trauma (ASPECTS)

	Two-weeks post-trauma ($n = 226$)			Nine-weeks post-trauma ($n = 208$)			McNemar
Diagnosis	n	Absolute %	Relative %	n	Absolute %	Relative %	Test
PTSD	41	18.1	-	20	9.6	-	$p = 0.002$
PTSD-DS	16	7.1	39.0	8	3.8	40.0	$p = 0.02$

Note. PTSD statistics previously reported in Meiser-Stedman et al. (2017)

Predictive Value

The degree to which a diagnosis of 'two-week PTSD-DS' predicted a diagnosis of PTSD at nine-weeks following single-event trauma can be seen in Table 5. Regression statistics indicate 'two-week PTSD-DS' was significantly predictive of later PTSD ($\chi^2 = 14.65$, $p < 0.0001$, odds ratio = 10.71). The positive predictive value, negative predictive value and specificity were similar for 'two-week PTSD-DS' compared to 'two-week PTSD', however the sensitivity was considerably lower for 'two-week PTSD-DS'.

Table 5

Positive and negative predictive values, sensitivity, specificity of two-week diagnosis to predict nine-week PTSD diagnosis following single-event trauma (ASPECTS)

Two-week Predictor	Nine-week Outcome	Positive Predictive Value	Negative Predictive Value	Sensitivity	Specificity	Percentage Correctly Identified
'Two-week PTSD'	PTSD	0.41	0.97	0.75	0.88	87.0
'Two-week PTSD-DS'	PTSD	0.44	0.93	0.35	0.95	89.4

Note. PTSD statistics previously reported in Meiser-Stedman et al. (2017)

PTSS and Functional Impairment

Significant predictors of PTSS and functional impairment were assessed via hierarchical regression modelling where predictor variables were entered in two steps (see Tables 6 and 7). For PTSS, post-trauma cognitive processing accounted for considerable variance in both the single-event trauma (ASPECTS; nine-weeks post trauma) and multi-event trauma (C-CATS; baseline) studies. Whilst the addition of dissociation improved the model in both cases, the amount of additional variance explained was minimal, especially for multi-event trauma youth (C-CATS). For functional impairment, PTSS accounted for considerable variance in both the single-event trauma (ASPECTS; nine weeks post trauma) and multi-event trauma (C-CATS; baseline) studies. Whilst the addition of dissociation accounted for a small degree of additional variance in single-event trauma youth, the addition of dissociation did not significantly contribute to the model for multi-event trauma youth.

Significant predictors of early PTSS and functional impairment were additionally assessed cross-sectionally at two weeks, and longitudinally with predictor variables at two weeks predicting dependent variable at nine weeks, via hierarchical regression modelling of the single-event trauma study data only (see Appendix O and P for supplementary tables). Very similar results to those indicated in Tables 6 and 7 were produced where post-trauma cognitive processing accounted for considerable variance, and whilst the addition of dissociation improved the model, the amount of additional variance explained was minimal. For functional impairment, PTSS accounted for considerable variance, and whilst the addition of dissociation accounted for a small degree of additional variance, the amount of additional variance explained was minimal.

Table 6

Hierarchical regression model predicting PTSS (CPSS & CATS) considering post-trauma cognitive processing factors and persistent dissociation, following single- and multi-event trauma

Trauma type	Predictor variable	Model Adj. R^2	F test	ΔR^2	Step F test	Step 2 B	Bootstrapped 95% CI	β
Single-event trauma (ASPECTS; nine weeks post-trauma)								
	Step 1: Post-trauma cognitive processing	.66	$F_{3,224} = 149.9, p < 0.001$	.66	$F_{3,224} = 149.9, p < 0.001$			
	Memory quality					**.50**	**(.35, .65)**	.29
	Negative appraisals					**.32**	**(.26, .39)**	.43
	Self-blame					.16	(-.23, .55)	.03
	Step 2: Persistent dissociation	.75	$F_{4,223} = 172.4, p < 0.001$	.09	$F_{1,223} = 80.3, p < 0.001$	**2.22**	**(1.73, 2.71)**	.34
Multi-event trauma (C-CATS; baseline)								
	Step 1: Post-trauma cognitive processing	.74	$F_{3,96} = 95.3, p < 0.001$	.74	$F_{3,96} = 95.3, p < 0.001$			
	Memory quality					**.50**	**(.23, .76)**	.27
	Negative appraisals					**.37**	**(.23, .52)**	.50
	Self-blame					.23	(-.79, 1.24)	.03
	Step 2: Persistent dissociation	.75	$F_{4,95} = 76.2, p < 0.001$	.01	$F_{1,95} = 5.5, p = 0.021$	**.89**	**(.14, 1.65)**	.17

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Table 7

Hierarchical regression model predicting functional impairment (CPSS & CATS)

considering the effect of PTSS and persistent dissociation, following single- and multi-

event trauma.

Trauma type	Predictor variable	Model Adj. R^2	Model F test	Step ΔR^2	Step F test	Step 2 B	Step 2 Bootstrapped 95% CI	Step 2 β
Single-event trauma (ASPECTS; nine weeks post-trauma)								
	Step 1: PTSS	.41	$F_{1,229} = 162.7, p < 0.001$	.41	$F_{1,229} = 162.7, p < 0.001$	**.08**	**(.06, .09)**	.54
	Step 2: Persistent dissociation	.42	$F_{2,228} = 85.4, p < 0.001$	.01	$F_{1,228} = 5.2, p = 0.023$	**.14**	**(.02, .25)**	.15
Multi-event trauma (C-CATS; baseline)								
	Step 1: PTSS	.44	$F_{1,98} = 75.9, p < 0.001$	.43	$F_{1,98} = 75.9, p < 0.001$	**.10**	**(.07, .13)**	.72
	Step 2: Persistent dissociation	.44	$F_{2,97} = 74.1, p < 0.001$	.00	$F_{1,97} = 0.7, p = 0.412$	-.06	(-.22, .09)	-.09

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Characteristics of Youth with PTSD-DS

Demographic, trauma, psychopathology, post-trauma cognitive processing, and functional impairment factors, differentiated by diagnostic category, across single- (ASPECTS), multi-event (C-CATS), and mixed trauma (ASPECTS & C-CATS) samples are shown in Table 8. The distribution of data for psychopathology, post-trauma cognitive processing, and functional impairment, differentiated by diagnostic group, are shown in raincloud plots (Allen et al., 2019; Appendix Q).

Demographic variables were not significantly related to diagnostic group in all comparisons except sex, where there was a higher proportion of females in the PTSD-ND group compared to the PTSD-DS and no diagnosis groups following multi-event (C-CATS) and mixed trauma (ASPECTS & C-CATS). Levels of assault were highest in the PTSD-ND group compared to the PTSD-DS and no diagnosis groups following single-event trauma.

Table 8

Demographic, trauma, psychopathology, post-trauma cognitive processing, and functional impairment factors by diagnostic group following single- (ASPECTS; nine weeks post-trauma), multi-event (C-CATS; baseline) and mixed trauma (ASPECTS & C-CATS combined)

	Trauma type	Test of Significant Difference	PTSD-DS		PTSD-ND		No diagnosis	
			M	*SD*	*M*	*SD*	*M*	*SD*
Demographic factors								
Age	Single	$H(2) = 1.8, p = 0.415$	14.6	2.4	15.3	2.3	13.9	3.0
	Multiple	$H(2) = 1.2, p = 0.560$	13.8	2.9	14.0	2.8	13.2	1.9
	Mixed	$H(2) = 1.8, p = 0.403$	14.2	2.6	14.5	2.6	13.7	2.8
Ethnic minority, *n* (%)	Single	$\chi^2(2) = 0.7, p = 0.693$	1	(10.0%)	0	(0.0%)	13	(6.0%)
	Multiple	$\chi^2(2) = 1.1, p = 0.584$	1	(14.3%)	2	(18.2%)	7	(8.8%)
	Mixed	$\chi^2(2) = 1.0, p = 0.596$	2	(11.8%)	2	(11.1%)	20	(6.7%)
Female Sex, *n* (%)	Single	$\chi^2(2) = 2.1, p = 0.345$	2	(20.0%)	3	(42.9%)	94	(43.3%)
	Multiple	$\chi^2(2) = 11.4, p = 0.003$	4	(44.4%)[a]	11	(100%)[b]	42	(46.7%)[a]
	Mixed	$\chi^2(2) = 9.2, p = 0.010$	6	(31.6%)[a]	14	(77.8%)[b]	136	(44.3%)[a]
Trauma type								
Assault (non-sexual), *n* (%)	Single	$\chi^2(2) = 26.9, p < 0.001$	5	(50.0%)[a]	5	(71.4%)[b]	27	(12.4%)[c]
Sexual abuse, *n* (%)	Multiple	$\chi^2(2) = 1.7, p = 0.428$	4	(44.4%)	7	(63.3%)	36	(42.9%)
Psychopathology								
PTSS[†]	Single	$H(2) = 45.0, p < 0.001$	33.3[a]	6.9	38.7[a]	4.6	7.0[b]	8.6
	Multiple	$H(2) = 45.9, p < 0.001$	39.2[a]	9.5	29.7[b]	6.8	8.8[c]	8.0
Anxiety[†]	Single	$H(2) = 30.6, p < 0.001$	38.8[a]	12.8	46.7[a]	14.1	14.7[b]	14.5
	Multiple	$H(2) = 28.8, p < 0.001$	21.4[a]	6.5	11.3[b]	6.3	5.0[c]	5.6
Depression[†]	Single	$H(2) = 26.1, p < 0.001$	10.2[a]	5.8	15.0[a]	5.2	3.9[b]	4.9
	Multiple	$H(2) = 29.3, p < 0.001$	17.4[a]	7.49	9.8[b]	7.1	3.5[c]	4.4
Post-trauma cognitive processing								
Memory quality	Single	$H(2) = 33.9, p < 0.001$	31.4[a]	3.9	32.9[a]	4.5	20.4[b]	5.9
	Multiple	$H(2) = 38.9, p < 0.001$	35.0[a]	4.4	26.2[b]	4.2	17.8[c]	5.1
	Mixed	$H(2) = 68.0, p < 0.001$	33.2[a]	4.5	28.8[b]	5.3	19.6[c]	5.8
Negative appraisals	Single	$H(2) = 33.0, p < 0.001$	56.3[a]	12.5	75.0[b]	16.2	35.0[c]	12.5
	Multiple	$H(2) = 34.9, p < 0.001$	75.5[a]	12.7	55.6[b]	17.2	35.5[c]	11.6

	Trauma type	Test of Significant Difference	PTSD-DS		PTSD-ND		No diagnosis	
			M	*SD*	*M*	*SD*	*M*	*SD*
	Mixed	$H(2) = 67.5, p < 0.001$	65.9[a]	15.7	63.1[a]	19.0	35.1[b]	12.3
Self-blame	Single	$H(2) = 5.8, p = 0.056$	4.9	2.3	2.4	0.8	3.3	1.9
	Multiple	$H(2) = 22.5, p < 0.001$	5.3[a]	2.8	4.6[a]	2.3	2.5[b]	1.1
	Mixed	$H(2) = 15.2, p < 0.001$	5.1	2.5	3.8	2.2	3.1	1.7
Functional impairment[†]								
	Single	$H(2) = 45.2, p < 0.001$	3.8[a]	2.0	4.1[a]	1.2	0.7[b]	1.3
	Multiple	$H(2) = 24.3, p < 0.001$	3.8[a]	1.7	3.4[a]	1.4	1.3[b]	1.7

Note. Superscript letters represent significant between group differences. Single-event trauma study (ASPECTS) – PTSD-DS (n = 10), PTSD-ND (n = 7), no diagnosis (n = 217). Multi-event trauma study (C-CATS) – PTSD-DS (n = 9), PTSD-ND (n = 11), no diagnosis (n = 90). Mixed trauma (ASPECTS & C-CATS) – PTSD-DS (n = 19), PTSD-ND (n = 18), no diagnosis (n = 307). Groups were determined by self-report questionnaires (CPSS for ASPECTS, CATS for C-CATS). *M* = mean, *SD* = standard deviation.

† Indicates variable that was tested using different questionnaires in single- and multi-event trauma studies (ASPECTS & C-CATS).

In all measures of psychopathology, both PTSD-ND and PTSD-DS groups scored higher than the no diagnosis group. Post hoc comparisons indicated levels of PTSS, anxiety, and depression were all greater in the PTSD-DS group compared to the PTSD-ND group following multi-event trauma (C-CATS), whereas no statistically significant differences between the PTSD-ND and PTSD-DS groups were observed following single-event trauma.

Regarding measures indexing post-trauma cognitive processing, there were significant differences for all processes, except self-blame following single-event trauma (ASPECTS), where PTSD-ND and PTSD-DS diagnostic groups scored significantly higher than the no diagnosis group in all other cases. Poorer memory quality was associated with PTSD-DS following multi-event trauma (C-CATS) and mixed trauma (ASPECTS & C-CATS), and more negative appraisals was associated with PTSD-DS following multi-event trauma (C-CATS), whereas fewer negative appraisals were associated with PTSD-DS following single-event trauma (ASPECTS).

Finally, levels of functional impairment were higher in the PTSD-ND and PTSD-DS groups compared to the no diagnosis group following both single- and multi-event trauma; however, no one diagnostic group had significantly higher levels of functional impairment than the other.

Post hoc bootstrapped comparisons (2000 resamples used) were made to assess whether outliers or the distribution of data may have influenced the differences between PTSD-ND and PTSD-DS groups. However, the results were very similar following these post-hoc analyses, indicating that outliers and data distribution did not significantly impact the findings.

A post-hoc exploratory analysis of characteristics of youth with PTSD-DS was repeated, however using the CPTSDI for the single-event trauma dataset (ASPECTS; Appendix R). Results were very similar to those presented in Table 8, indicating that the method of diagnostic assessment did not significantly impact the findings.

Discussion

This study is one of the first to investigate PTSD-DS in two child and adolescent populations, across both single-event and multi-event trauma indexes. The first part of the analysis primarily focussed on data from the single-event trauma study to establish the point prevalence, course, and prognostic ability of PTSD-DS regarding PTSD in youth. Whilst the absolute prevalence rates indicated PTSD-DS is not common following traumatic exposure, a significant proportion of those who went on to meet the threshold for a diagnosis of PTSD also had PTSD-DS. The PTSD-DS prevalence range of 39-45% found in this study was higher than the pooled estimate for adults reported by White et al. (in press); although, it needs to be re-stated that the prevalence of PTSD-DS, calculated from the multi-event trauma data, was based on child self-report rather than a structured interview. Additionally, the prevalence range of 39-45% fell within the 95% confidence intervals for the prevalence of PTSD-DS in adults found in White et al. (in press; see Appendix E for supplementary table where the DSM-5 criteria for PTSD was rigorously

applied for determining the prevalence). Nonetheless, the relatively high prevalence rate provides tentative further evidence that PTSD-DS is more common in children and adolescents than adults. This may be because symptoms of dissociation (depersonalisation and derealisation) stipulated as criteria in the DSM-5 are not specific enough indicators of this subtype in children, in contrast to adults (Kerig et al., 2016). The subtype model was proposed as a way of defining a rare dissociative subgroup (Lanius et al., 2012); however, experiences of depersonalisation and derealisation may be more common in children (Carlson et al., 2009). While the relative prevalence of PTSD-DS was higher following multi-event trauma compared to single-event trauma, key differences in how PTSD-DS was assessed may have impacted measured prevalence. Significant recovery was seen in rates of PTSD-DS without intervention following single-event trauma, which lends further evidence that course of dissociative symptoms is consistent with the natural reduction of PTSS over time.

The ability for PTSD-DS at two weeks post-trauma to predict PTSD at nine weeks following single-event trauma was similar to the predictive ability of PTSD, although there was a marked drop-off in sensitivity. This is consistent with the premise that acute symptoms of dissociation are not predictive of later PTSD (Bryant et al., 2007; Dalgleish et al., 2008; Meiser-Stedman et al., 2005), and dissociation may simply be a normal symptom in the immediate aftermath of a traumatic experience that does not indicate a more severe PTSD.

The second part of this study, focussing on both data from youth exposed to single- and multi-event trauma, demonstrated that dissociation accounted for little to no additional variance in both PTSS and functional impairment, over and above the variance accounted for by post-trauma cognitive processing factors and PTSS respectively. This held true when analyses were repeated cross-sectionally and longitudinally using two weeks post single-event trauma data, and using two week predictors and nine week outcome variables post single-event trauma. While not increasing the amount of variance

explained, persistent dissociation appears to account for unique variance in models of

PTSS, however the beta coefficients were smaller than those for negative appraisals.

Whilst this evidences the importance of cognitive processes and supports the applicability

of the cognitive model to PTSD, perhaps there is overlap between dissociation and other

cognitive processes; for example, perhaps dissociation is driven by negative appraisals or

fragmented memory. This is an area for further research. Given dissociation appears to

play next to no part in predicting functional impairment, dissociation may not be such a

concerning aspect of PTSD.

A final exploratory analysis, utilising data from youth exposed to single- and multi-

event trauma, demonstrated many significant differences between diagnostic and non-

diagnostic groups across a range of factors. The primary finding was that in most cases,

both diagnostic groups scored significantly higher in areas of psychopathology, post-

trauma cognitive processing, and functional impairment, compared to non-diagnostic

controls. This highlights that despite all children having experienced some form of

traumatic exposure, those children with PTSD are significantly more pathological and

impaired compared to those who do not meet the criteria for PTSD. Regarding significant

differences between diagnostic groups, there was an observable pattern where levels of

indicated psychopathology, post-trauma cognitive processing, and functional impairment

were increased in the PTSD-DS group compared to the PTSD-ND group following multi-

event trauma, whereas the opposite was true following single-event trauma. However firm

conclusions cannot be drawn on the basis of this final exploratory and comparative

analysis with regard to diagnostic group comparisons, due to the poor power and small

sample size. It was interesting that there was no difference in levels of functional

impairment between diagnostic groups; the implication being that PTSD-DS is no more or

less functionally harmful that 'classic' PTSD-ND. However, caution needs to be taken due

to the comparison being underpowered, and the low sensitivity of the functional

impairment measures based on the sum of "yes" answers (rather than the binary "no"

answers) on five or six items relating to various areas of life. The comparisons of mixed

trauma samples were more highly powered than those for single- and multi-event trauma

only and indicated that female sex was associated with PTSD-ND rather than PTSD-DS,

and that poorer memory quality was associated with PTSD-DS rather than PTSD-ND. This

evidences the importance of poorer and more fragmented trauma memories in the

maintenance of PTSD-DS, as with PTSD (Hiller et al., 2021), and supports applicability of

the cognitive model to this PTSD subtype. Impairments in memory have long been

attributed as a symptom of dissociation (Lanius et al., 2012; McKinnon et al., 2016). With

regard to sex, there is conflicting evidence regarding associations to PTSD-DS. Műllerová

et al. (2016) and Stein et al. (2013) found that PTSD-DS was associated with male sex,

whereas Hagan et al. (2018) found that there was an association with female sex in a small

sample of children. Further research is required to ascertain if sex is a risk factor to PTSD-

DS following traumatic exposure using larger sample sizes.

This study has demonstrated that there is significant natural recovery in terms of

PTSD-DS following single-event trauma, and therefore clinicians should be cautious about

offering an intervention when a period of monitoring might be more beneficial. Early

dissociation (at two weeks) is no more predictive of later PTSD (at nine weeks) than early

PTSD. Dissociation has been shown to be secondary to other cognitive mechanisms that

maintain PTSD such as fragmented memories and negative appraisals, and whilst this latter

cognitive mechanism appears to mediate treatment response (Jensen et al., 2018; Pfeiffer et

al., 2017), no such interaction has been found regarding dissociation (Hoeboer et al.,

2020). It has been suggested that treatments should be altered for individuals experiencing

dissociation symptoms alongside PTSD (Lanius et al., 2010) and clinicians perceive

dissociation to be a barrier to PTSD treatment (Becker et al., 2004; Ronconi et al., 2014).

This study however suggests dissociation may simply be a routine component of the

presentation of PTSD in children and therefore may not be something to be feared within

the clinical setting. Perhaps instead clinicians can assess for, and recognise, a wide breadth

of symptoms of dissociation (given the high prevalence indicated both in this study and in White et al., in press), especially as dissociation has been linked to self-harm (Rossi et al., 2019). Whilst it has been shown that dissociation does not moderate the effectiveness of psychotherapy for PTSD (Hoeboer et al., 2020), if a young person does not respond well to treatment on account of dissociation, perhaps a differentiated approach could be offered. This could involve a modular approach where PTSD symptom clusters are targeted in a person-centred manner as determined by idiosyncratic formulation (Karatzias & Cloitre, 2019). Exposure based therapies are often used to treat PTSD symptoms, and dissociation can impact the ability to connect with the present moment during the process of reliving traumatic memories (Jowett et al., 2022) and create avoidance (Murray et al., 2022). Adaptations to therapy could include using reminders of the present such as: objects or sensory experiences, keeping eyes open at all times, speaking in the past tense, regular therapist verbal communication, and via the use of narrative rather than imaginal reliving (Murray et al., 2022). The use of treatment methods such as trauma-focussed CBT should focus on cognitive mechanisms such as fragmented memories and negative appraisals, as per the cognitive model of PTSD (Ehlers & Clark, 2000), especially given the importance these processes have in maintaining PTSS (see Table 6).

These results should be viewed in the context of several limitations. Firstly, both single- and multi-event trauma samples were based on predominantly White British children based in two specific regions in the UK, having been exposed to specific types of trauma. Therefore, the results may not be generalisable. All self-report questionnaires were completed by children, and given Hiller et al. (2021) reported poor agreement between child and carer reported measures of traumatic exposure, this raises questions about accuracy of reporting, where young people likely under-reported symptoms in the multi-event trauma study (C-CATS). Furthermore, self-reported measures were used to diagnose PTSD and PTSD-DS; some measures having been developed specifically for the single-event trauma study (ASPECTS) where construct validity could not be assessed. Moreover,

there were discrepancies between the methodologies used in the ASPECTS and C-CATS studies which make cross study comparisons less valid as a result of measurement bias. Functional impairment was measured via different scales, and whilst PTSS was measured using the same four items, they were phrased in the first person in the multi-event trauma study (C-CATS) and third person in the single-event trauma study (ASPECTS). Additionally, the items were assessed over a subtly different scale (see Appendix K & M). Finally, several analyses, particularly those presented in Table 8, were underpowered and were therefore unable to detect even large effect sizes or may have led to some bias. Small groups in Table 8 resulted in some chi-squared analyses breaking the assumption that fewer than 20% of cells have an expected count less than five. Unfortunately, a Fishers exact test could not be conducted on account of the analysis being a 3x2 design.

Conclusion

PTSD-DS is prevalent in children with PTSD nine weeks post single-event trauma (40.0%) and following multi-event trauma (45.0%). However, PTSD-DS does not appear to present as a particularly concerning subtype given it shows a similar trajectory of natural recovery to PTSD, it does not appear to be additionally indicative of later PTSD, and dissociation does not appear to be a significant factor in PTSS or functional impairment. Therefore, PTSD-DS may offer little clinical utility to the extant PTSD diagnosis in children and adolescents. However, PTSD-DS was associated with sex, and post-trauma cognitive processing factors, although the group comparisons were frustrated by very low sample sizes. Further investigation and research, longitudinally over longer time periods, with a greater number of participants, is warranted into PTSD-DS in children following both single- and multi-event trauma.

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Chapter 5. Additional Methodology

This chapter details additional methodological processes that should be considered supplementary to those in Chapters 2 and 4.

Additional Methodology for Systematic Review

PRISMA Checklist

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist 2020 (Page et al., 2021) was used to ascertain exactly where the meta-analysis covered the relevant requirements of a systematic review of this nature (see Appendix S). This helped to provide a transparent account of the reasons for conducting the review, the process undertaken to complete the review, and what results were found. Additionally, applying the PRISMA Checklist is a requirement of some journals when submitting manuscripts for publication.

Further Inclusion and Exclusion Criteria

Studies were included in the systematic review if the point prevalence of the dissociative subtype of post-traumatic stress disorder (PTSD-DS) following a traumatic event was calculated. Previous studies have used a variety of methods to determine the prevalence of PTSD-DS, some based on participants who scored above a clinical cut-off on a validated measure or who met Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnostic criteria following a clinical interview or self-report measure. Other methods of prevalence estimation were latent class and profile analyses (LCA and LPA respectively), where individuals are probabilistically grouped into classes or profiles following an analysis of mental health indicators (Collins & Lanza, 2010). The resulting classes or profiles are therefore in theory internally homogenous and externally heterogenous (Berlin et al., 2013). A real advantage of LCA and LPA is that there is an indication of best-fitting solution regarding the number of classes or profiles, allowing for decisions to be made around which model is most appropriate (Vermunt & Magidson, 2002) and for comparison between models (Miettunen et al., 2016).

Data Extraction

A data extraction database was used to document the following information pertinent for inclusion in the systematic review: (a) author(s), (b) year of publication, (c) journal title, (d) demographic information (mean and standard deviation of age, the age range, child or adult category, the percentage of the sample female, a description of the sample population), (e) type and nature of index trauma experienced, (f) time since index trauma to assessment of post-traumatic stress disorder (PTSD), (g) type of analysis used to determine the prevalence of PTSD and PTSD-DS, (h) DSM criteria used to conceptualise both PTSD and PTSD-DS, (i) the prevalence of PTSD and PTSD-DS. Where information was missing, authors were contacted directly via email.

Additional Methodology for Empirical Paper

Secondary Analysis of Pre-Existing Datasets

As described previously, the empirical study made use of two pre-existing datasets from longitudinal studies which recruited large samples of children following: experiences of single-event trauma [Acute Stress Programme for Children and Teenagers (ASPECTS); Meiser-Stedman et al., 2017], and experiences of multi-event trauma [Coping in Care After Trauma study (C-CATS); Hiller et al., 2021]. Datasets had been anonymised to maintain confidentiality by removal of information such as names, dates of birth, National Health Service numbers and recruitment site. Both longitudinal studies had undergone full ethical review, and therefore no further ethical approval was required for the empirical study.

Participants

ASPECTS

Participants were children and adolescents aged eight to 17-years-old who had experienced a single-event trauma between 3rd September 2010 and 30th April 2013, and presented at one of four emergency departments in the East of England. An event was considered a trauma if it met the DSM-5 Criterion A for PTSD [American Psychiatric Association (APA), 2013]. Participant exclusion criteria included inability to speak

English, presence of a learning disability or a moderate to severe brain injury, emergency department attendance due to deliberate self-harm, or when the child was under the care of social services or where there was a child protection issue related to the trauma.

A total of 773 children were identified as suitable for the study, however only 226 completed the initial two-week assessment post-trauma. The first part of the analysis investigated these 226 participants [days since trauma, mean (M) = 22.0, standard deviation (SD) = 7.2], and, of these, 208 participants also completed an assessment nine-weeks post-trauma (days since trauma, M = 67.5, SD = 11.7). For full details of demographic information for these participants, see Meiser-Stedman et al. (2017; 2019). The second part of the analysis investigated participants (n = 234; days since trauma, M = 67.3 days, SD = 11.2) who completed the Children's PTSD Symptom Scale (CPSS) at the nine-week assessment only.

C-CATS

Participants were children and adolescents aged ten to 18-years-old who had been removed from their family home and were in the care of a nonbiological foster carer, in kinship care, or resided in residential care homes following abuse or neglect. The average age for entering care was 8.3 years old (SD = 3.8), and participants had been in care between six months and 15 years (M = 4.9 years, SD = 3.7). All 120 participants had been exposed to some form of maltreatment, with 77% identifying that they had been exposed to at least one DSM-5 PTSD Criterion A trauma (APA, 2013); this proportion increasing to 85% on the basis of carer-report. For full details of participant demographic information, see Hiller et al. (2021).

Whilst 120 participants were detailed in the Hiller et al. (2021) study, data was missing from ten participants, which were therefore excluded from the analysis in this study, leaving 110 participants (days since trauma, M = 1735.6 days, SD = 1307.0).

Measures

ASPECTS

The following information pertains to the scoring and psychometric qualities of each of the measures used in the analysis in Chapter 4. As indicated in Meiser-Stedman et al. (2019), published measures validated for use with children were preferred, where there was good evidence of both internal consistency and construct validity. Where no such measure was available, the authors developed their own measures (Meiser-Stedman et al., 2019).

The Children's PTSD Inventory (CPTSDI; Saigh et al., 2000), a youth-report structured interview assessing for PTSD, has good internal consistency, inter-rater reliability, test–retest reliability, convergent validity, and discriminant validity (Saigh et al., 2000; Yasik et al., 2001).

Items in the Children's PTSD Symptom Scale (CPSS; Foa et al., 2001) were rated on a 0 (not at all or only one time) to 3 (5 or more times a week/almost always) scale, where total score could range from 0 to 60. The CPSS has been shown to have excellent internal consistency, test-retest reliability, and good convergent validity (Gillihan et al., 2013); and excellent internal consistency and good test-retest reliability within the ASPECTS sample (Meiser-Stedman et al., 2019). The score for the four additional items measuring persistent dissociation (Meiser-Stedman et al., 2019; see Appendix K) could range from 0 to 12. Meiser-Stedman et al. (2019) stated that these items demonstrated good internal consistency and test-retest reliability within the ASPECTS sample.

Each item in the Spence Child Anxiety Scale (SCAS; Spence, 1998) was rated on a 0 (never) to 3 (always) scale, where the total scores could range from 0 to 114. Ramme (2008) detailed how a large body of literature supported the internal reliability, test-retest reliability, convergent and divergent validity, discriminant validity and construct validity of the SCAS.

Items in the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995) were rated on a 0 (not true) to 2 (true) scale, where the total score could range from 0 to 26. The SMFQ has been shown to demonstrate good discriminate validity and high internal

reliability (Angold et al., 1995; Messer et al., 1995), and excellent internal consistency and test-retest reliability within the ASPECTS sample (Meiser-Stedman et al., 2019).

Items in the Trauma Memory Quality Questionnaire (TMQQ; Meiser-Stedman, Smith, Yule et al., 2007) were rated on a 1 (disagree a lot) to 4 (agree a lot) scale, where the total score could range from 11 to 44. The TMQQ showed good internal consistency, criterion validity, and construct validity (Meiser-Stedman, Smith, Yule et al., 2007), and good internal consistency and excellent test-retest reliability within the ASPECTS sample (Meiser-Stedman et al., 2019).

Each item in the Children's Post-Traumatic Cognitions Inventory (CPTCI; Meiser-Stedman et al., 2009) was rated on a 1 (don't agree at all) to 4 (agree a lot) scale, where the total score could range from 25 to 100. The CPTCI showed good internal consistency, test-retest reliability, convergent validity, and discriminative validity (Meiser-Stedman et al., 2009), and excellent internal consistency and test-retest reliability within the ASPECTS sample (Meiser-Stedman et al., 2019).

Finally, two novel items assessing self-blame (Meiser-Stedman et al., 2019; see Appendix L) were rated on a 1 (disagree a lot) to 4 (agree a lot) scale, where the total score could range from 2 to 8. Meiser-Stedman et al. (2019) asserted that these demonstrated excellent internal consistency and good test-retest reliability within the ASPECTS sample.

C-CATS

The young person or carer could indicate 'yes' or 'no' whether they had been exposed to any of 15 Criterion A traumas according to the PTSD DSM-5 criteria (APA, 2013). Additionally, social workers reported the trauma history of the child via Kaufman's 5-point Likert scale, which assessed for: physical, sexual, emotional abuse, and exposure to domestic violence (Kaufman et al., 1994).

Each item on the Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017) was rated by the young person on a 0 (never) to 3 (almost always) scale, where the total score could range from 0 to 60. Hiller et al. (2021) reported a strong internal

consistency for child-report completion, and Sachser et al. (2017) detailed excellent reliability.

Anxiety and depression were measured via the Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012); a shorter version of the full RCADS. Each item was rated by the young person on a 0 (never) to 3 (always) scale. The RCADS-25 is formed of two subscales indexing anxiety and depression (possible range of total scores from 0 to 45 and 0 to 30 respectively). The RCADS-25 demonstrates acceptable reliability, excellent internal consistency, acceptable to good test-retest reliability (Ebesutani et al., 2012; Ebesutani et al., 2017).

The same measures were used as in the ASPECTS study to assess post-trauma cognitive processing, and persistent dissociation.

Procedure

ASPECTS

Research nurses identified children at hospital emergency departments who might be suitable to take part, and details of the proposed study and information sheets regarding the research study were provided. Consent was gained for a member of the ASPECTS team to contact the family. Informed written consent was sought from both the child and parent or carer in order to participate in the study. The children and their parents were then sent a letter following their attendance at the emergency department and asked to complete self-report questionnaires. Participants were then contacted by telephone by graduate-level psychologists a week after the emergency department attendance to arrange the first two-week post-trauma assessment. Two clinical psychologists, with experience interviewing children exposed to trauma, blind-rated the interviews to test for diagnostic reliability, which was found to be excellent (Meiser-Stedman et al., 2017). For the duration of the study, participants were not offered any form of psychological or psychiatric intervention. For further information on the study procedure see Meiser-Stedman et al. (2017; 2019).

C-CATS

Participants were recruited by social workers who had parental responsibility for the child, and of the 242 children that were consented by their social worker, 120 child and their carers volunteered and consented to participate. All assessments were self- or carer-report and were completed during a home visit or were sent via post or online. Following initial assessment, repeated further assessment took place at six- and 12-months, however only data from baseline assessment were used in the empirical study. For further information on the procedure see Hiller et al. (2021).

Additional Analyses

Some studies assessing PTSD (Cohen et al., 2004; Copeland et al., 2007; Meiser-Stedman et al., 2017; Nixon et al., 2012) and PTSD-DS (Bennett et al., 2015; Kerig et al., 2016; Modrowski & Kerig, 2017) in children used subsyndromal criteria for diagnosis. This ensured cases were not missed where clinically significant traumatic stress persisted and where the threshold for a full adult diagnosis of PTSD was not reached. This is in line with evidence that has shown children who have experienced a traumatic event but do not meet the full diagnostic criteria still exhibit symptoms significant enough to interfere with functioning (Cohen & Scheeringa, 2009). As younger children have more impaired cognitive and verbal expression capacities, more behaviourally focussed and developmentally appropriate criteria have been suggested (Scheeringa et al., 1995; 2001), and therefore the preschool PTSD diagnosis introduced in DSM-5 may be more appropriate than the full adult criteria for older children, including adolescents, on account of its simplicity (APA, 2013; Danzi & La Greca, 2017; Meiser-Stedman et al., 2008; 2017; Scheeringa et al., 2006). Therefore, the first part of the analysis in the empirical paper was repeated using preschool PTSD criteria rather than the full adult diagnostic criteria for PTSD, to assess the point prevalence, course and predictive value of the preschool diagnosis in the ASPECTS study dataset. This additional analysis was not considered fundamental to answering the research questions and achieving the aims in the empirical paper, and therefore was not reported earlier.

Further post-hoc exploratory analyses were repeated based on the data in the second part of the analysis in the empirical paper. Due to the bidirectional results for PTSS between the single- and multi-event trauma samples (ASPECTS and C-CATS) in Table 8 of Chapter 4, it was decided that further exploration of the clustered DSM-5 criteria would illuminate specific aspects of PTSD symptomology that may characterise PTSD-DS. Therefore, the Kruskal-Wallis ANOVA in Table 8 was repeated, utilising the same three groups [PTSD-DS, non-dissociative PTSD (PTSD-ND), and no diagnosis] formed on the basis of the DSM-5 criteria using the CPSS for the ASPECTS data and the CATS for the C-CATS data. In this exploratory analysis, groups were compared across scores in each of the clustered criteria described in the DSM-5 for PTSD (APA, 2013). Other studies conducting similar analyses have found that PTSD-DS has been associated with re-experiencing symptoms generally, but more specifically with flashbacks (Stein et al., 2013; Wolf, Miller et al., 2012), however, this result has not been replicated however in other studies (Steuwe et al., 2012b; Wolf, Lunney et al., 2012).

Chapter 6. Additional Results

This chapter details additional results that should be considered supplementary to those in Chapters 2 and 4. The method sections in Chapter 2 and 4, alongside the additional methods section in Chapter 5, provide all necessary information to the analyses undertaken in this chapter.

Additional Results for Systematic Review

Risk of Bias Assessment

Assessment of study quality is recommended as good practice when conducting a meta-analysis (Higgins et al., 2012). The proportion of studies rated as a low, moderate or high risk of bias for each quality assessment item can been seen in Appendix D. Four of the five quality assessment items indicated that 50.9-100% of the studies presented a low to medium risk of bias. However, 77.4% of the studies failed to meet the item "appropriate and meaningful post-traumatic stress disorder (PTSD) assessment follow up time". As already highlighted, Criterion F in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-V; American Psychiatric Association (APA), 2013] stipulates that PTSD symptoms must have been present for over a month. Therefore, in order for PTSD to be diagnosed, the assessment must take place at least one month following the index trauma. At assessment, the time since trauma was poorly reported across studies, perhaps because it can be challenging to identify the most salient index trauma for participants who have experienced multiple traumatic events (Priebe et al., 2018; Weathers & Keane, 2007). A high proportion of studies (49%) failed to meet the item 'participation rate greater than 50%'. This was mostly due to studies not reporting rates of drop-out or missing data.

Sensitivity Analyses

The level of between study prevalence heterogeneity was high in this review, and therefore sensitivity analyses were conducted to determine whether the quality of the studies impacted the prevalence estimates. In addition to the analysis in Chapter 2 where

the 28 studies of low and medium quality were removed, a secondary sensitivity analysis was conducted when only the 12 low quality studies were removed. The estimated point prevalence of the dissociative subtype of PTSD (PTSD-DS) was not dissimilar (35.2%, 95% CI 28.0 – 42.9%), with a similar degree of heterogeneity ($k = 41$, $Q(40) = 1010.0$, $p < 0.0001$, $I^2 = 97.7\%$), to the statistics when all studies were included. Meta-regression analysis indicated that the difference between high-medium and low-quality groups of studies were non-significant ($\beta = 0.0576$, 95% CI -0.1053–0.2206, $p = 0.49$). This provides further evidence that the quality of the studies did not affect the prevalence of PTSD-DS estimates.

Additional Results for Empirical Paper

Prevalence of Preschool PTSD-DS

The point prevalence of preschool PTSD and PTSD-DS at two- and nine-weeks following single-event trauma in the Acute Stress Programme for Children and Teenagers (ASPECTS; Meiser-Stedman et al., 2017) are presented in Table 9. The prevalence of PTSD-DS relative to those with PTSD was 40.9%, whereas the absolute prevalence relative to those that were trauma exposed was 8.2%, at baseline following multi-event trauma in the Coping in Care After Trauma study (C-CATS; Hiller et al., 2021) study (based on self-report rather than diagnostic structured interview).

Course of Preschool PTSD-DS

Absolute prevalence (the proportion of those with exposure to trauma) of both preschool PTSD and PTSD-DS approximately halved from two to nine weeks post-trauma, where the difference over time was significant only for preschool PTSD and not for preschool PTSD-DS (although the difference approached significance; see Table 9). The relative prevalence of PTSD-DS as a proportion of those with PTSD remained similar between two-weeks and nine-weeks post-trauma (37.8% and 40.0% respectively).

Table 9

Point prevalence of Preschool PTSD and PTSD-DS at two- and nine-weeks post-trauma following single-event trauma (ASPECTS)

	Time point						McNemar test
Diagnosis	**Two-weeks post-trauma** ($n = 226$)			**Nine-weeks post-trauma** ($n = 208$)			
	n	Absolute %	Relative %	n	Absolute %	Relative %	
Preschool PTSD	45	19.9	-	20	9.6	-	$p < .001$
Preschool PTSD-DS	17	7.5	37.8	8	3.8	40.0	$p = .06$

Note. Preschool PTSD statistics previously reported in Meiser-Stedman et al. (2017)

Predictive Value of Preschool PTSD-DS

The degree to which a diagnosis of 'two-week' preschool PTSD-DS predicted a diagnosis of preschool PTSD at nine-weeks can be seen in Table 10. Regression statistics indicated that preschool 'two-week PTSD-DS' was significantly predictive of later preschool PTSD ($\chi^2 = 18.53$, $p = < 0.0001$, odds ratio = 13.26). The positive predictive value, negative predictive value and specificity were similar for preschool 'two-week PTSD-DS' compared to preschool 'two-week PTSD', however the sensitivity was considerably lower for preschool 'two-week PTSD-DS'.

Table 10

Positive and negative predictive values, sensitivity, and specificity of two-week diagnosis to predict nine-week preschool PTSD diagnosis following single-event trauma (ASPECTS)

Week 2 Predictor	Week 9 Outcome	Positive Predictive Value	Negative Predictive Value	Sensitivity	Specificity	Percentage Correctly Identified
Preschool 'two-week PTSD'	Preschool PTSD	0.39	0.98	0.80	0.87	86.1
Preschool 'two-week PTSD-DS'	Preschool PTSD	0.47	0.94	0.40	0.95	89.9

Note. Preschool PTSD statistics previously reported in Meiser-Stedman et al. (2017)

Discussion of Preschool PTSD-DS Analyses

Results of the analyses relating to the preschool PTSD-DS diagnosis showed similar patterns to those presented in Chapter 4 concerning the prevalence, course and predictive value of the adult PTSD-DS diagnosis. Given no clear differences were identified between the use of either adult or preschool criteria for PTSD and PTSD-DS in terms of prevalence, course and predictive value, there is no reason to recommend use of one set of criteria over the other. However, as children may present with significant PTSD symptoms that interfere with functioning, and yet not achieve a diagnosis based on the adult criteria (Cohen & Scheeringa, 2009), it should be considered whether using the preschool criteria would be more appropriate.

Additional Exploratory Analyses

DSM-5 PTSD criteria symptom scores differentiated by diagnostic category are shown visually in Figures 3-6, and in Table 11. No criteria significantly differentiated the non-dissociative PTSD (PTSD-ND) and PTSD-DS groups, aside from Criterion B where for the single-event trauma study (ASPECTS), the PTSD-DS group showed significantly fewer intrusion symptoms; and Criterion C where for the multi-event trauma study (C-CATS), the PTSD-DS group showed significantly greater overall avoidance of trauma related stimuli. For almost all criteria, symptom endorsement was higher in the PTSD-DS group compared to the PTSD-ND group following multi-event trauma, whereas the opposite was true for following single-event trauma. Unfortunately, the single- and multi-event trauma groups could not be combined for this analysis, on account of the two studies using different measures to test for post-traumatic stress symptoms (PTSS).

Figure 3

Raincloud plot of reexperiencing symptom score by diagnostic group following single-event trauma [ASPECTS; Child PTSD Symptom Scale (CPSS)] and multi-event trauma [C-CATS; Child and Adolescent Trauma Screen (CATS)].
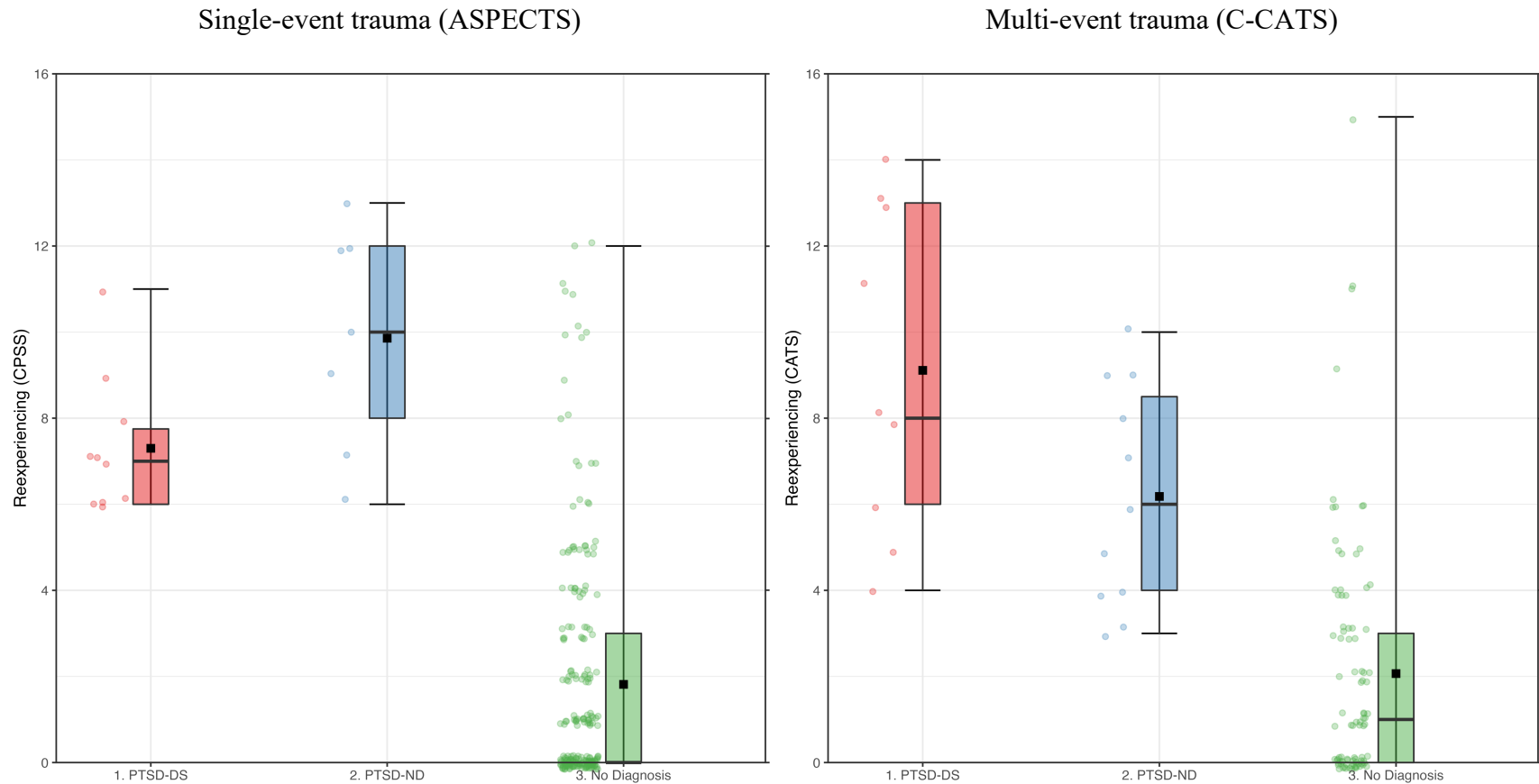
Note. Boxplots indicate the interquartile range, median, and maximum and minimum scores for the data. The mean of the data is indicated by the black square. Raw data is also displayed – please note that a degree of 'jitter' has been applied to make inspection of the data easier for the reader.

Figure 4

Raincloud plot of avoidance symptom score by diagnostic group following single-event trauma (ASPECTS; CPSS) and multi-event trauma (C-CATS; CATS).
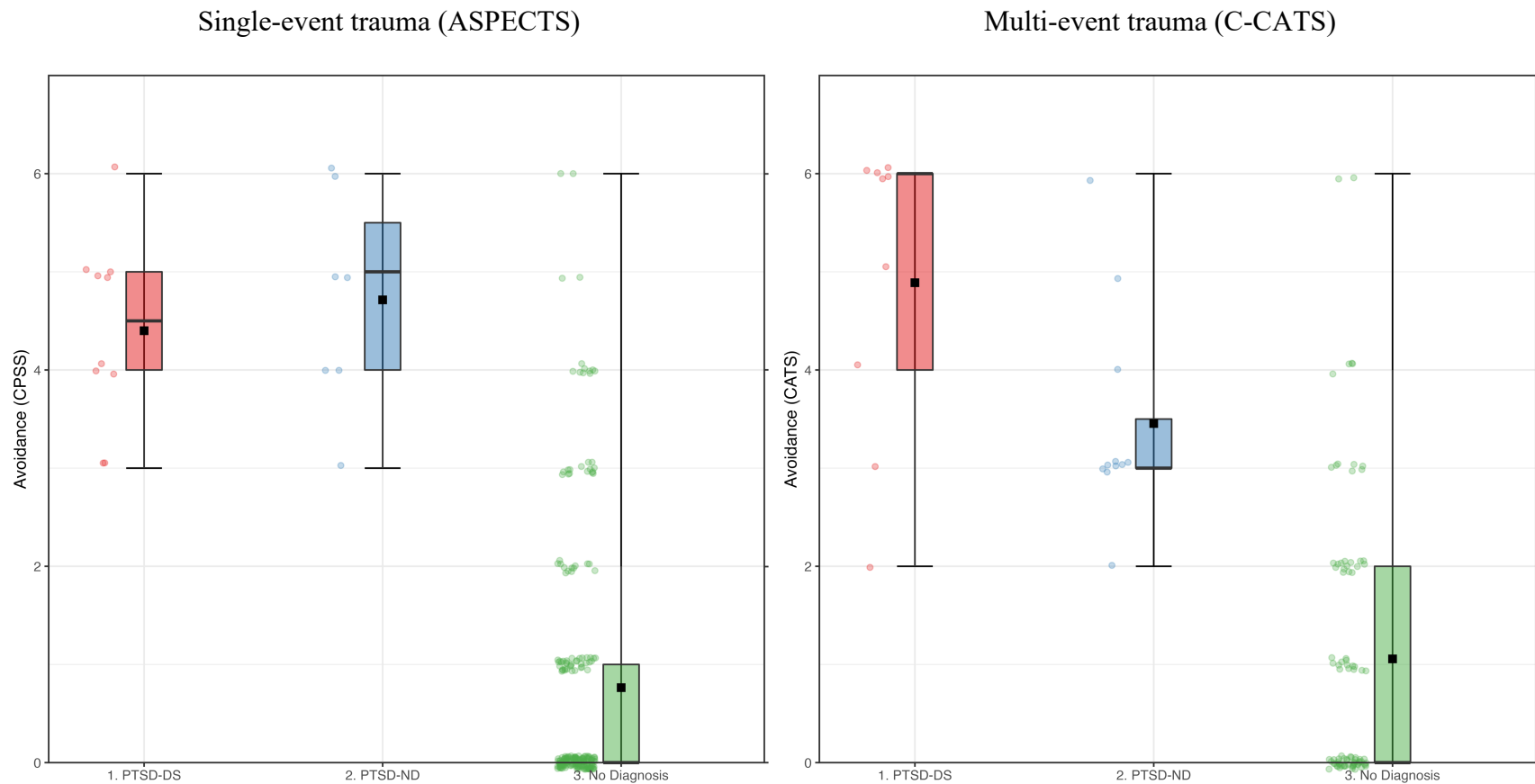
Note. Boxplots indicate the interquartile range, median, and maximum and minimum scores for the data. The mean of the data is indicated by the black square. Raw data is also displayed – please note that a degree of 'jitter' has been applied to make inspection of the data easier for the reader.

Figure 5

Raincloud plot of negative alterations in cognitions and mood symptom score by diagnostic group following single-event trauma (ASPECTS; CPSS) and multi-event trauma (C-CATS; CATS).
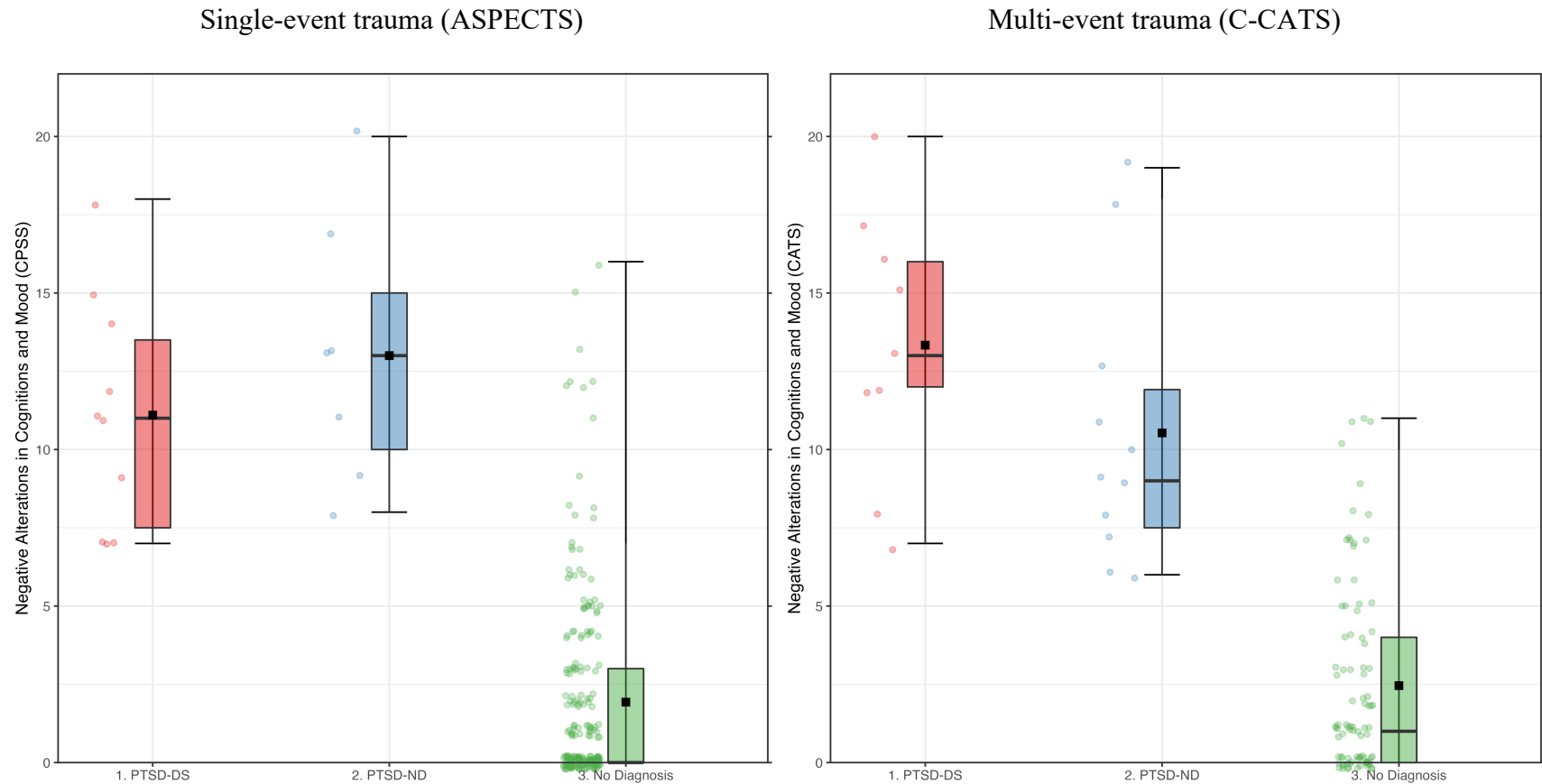
Note. Boxplots indicate the interquartile range, median, and maximum and minimum scores for the data. The mean of the data is indicated by the black square. Raw data is also displayed – please note that a degree of 'jitter' has been applied to make inspection of the data easier for the reader.

Figure 6

Raincloud plot of alterations in arousal and reactivity symptom score by diagnostic group following single-event trauma (ASPECTS; CPSS) and multi-event trauma (C-CATS; CATS).
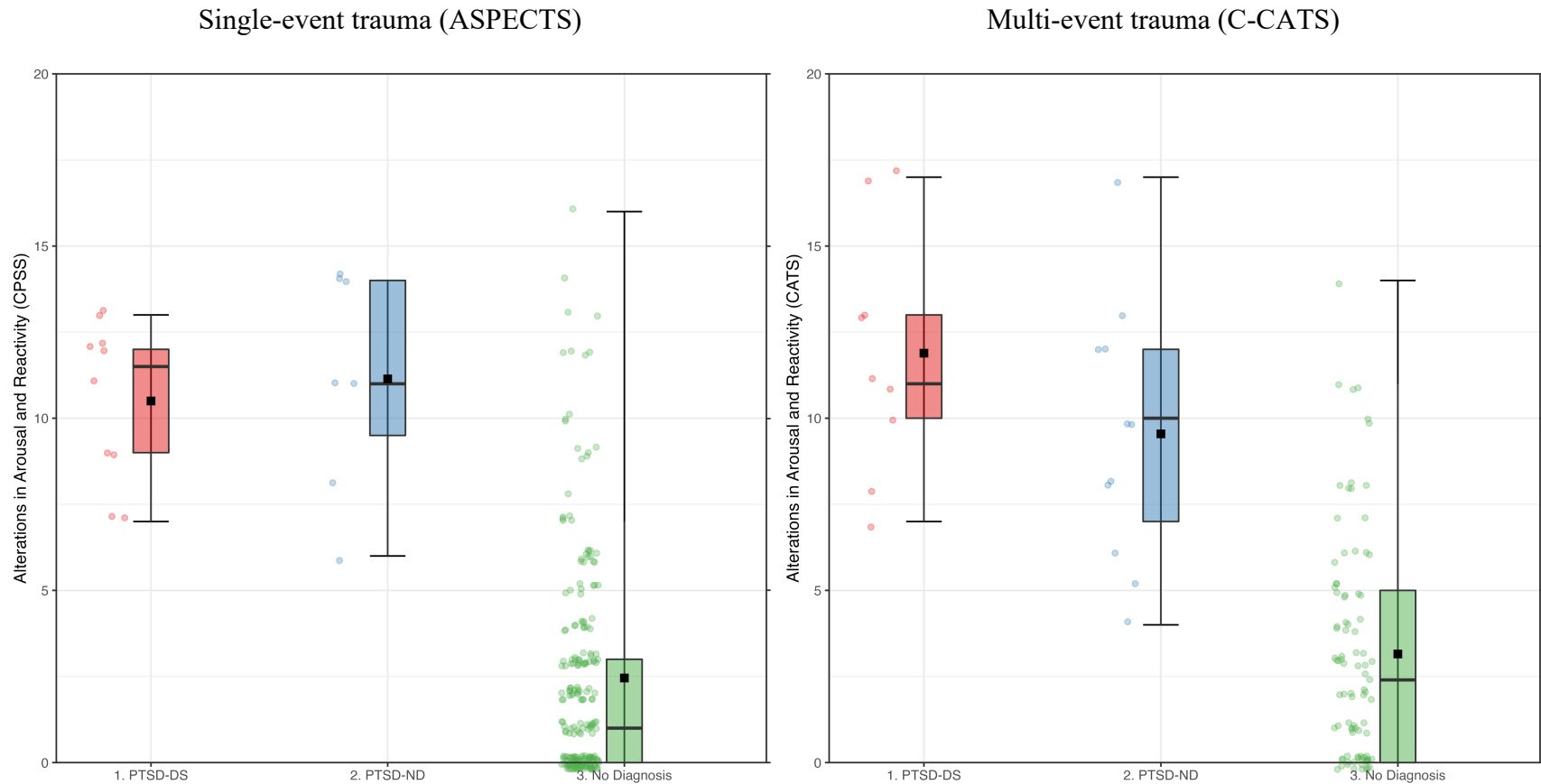
Note. Boxplots indicate the interquartile range, median, and maximum and minimum scores for the data. The mean of the data is indicated by the black square. Raw data is also displayed – please note that a degree of 'jitter' has been applied to make inspection of the data easier for the reader.

Table 11

DSM-5 PTSD diagnostic criteria by diagnostic group following both single- and multi-event trauma (ASPECTS & C-CATS respectively)

	Trauma type	Test of Significant Difference	PTSD-DS		PTSD-ND		No diagnosis	
			M	*SD*	*M*	*SD*	*M*	*SD*
B. Reexperiencing	Single	$H(2) = 42.8, p < .001$	7.3[a]	1.6	9.9[b]	2.7	1.8[c]	2.7
	Multi	$H(2) = 34.0, p < .001$	9.1[a]	3.8	6.2[a]	2.6	2.1[b]	2.8
C. Avoidance	Single	$H(2) = 52.2, p < .001$	4.4[a]	1.0	4.7[a]	1.1	0.8[b]	1.3
	Multi	$H(2) = 38.5, p < .001$	4.9[a]	1.5	3.5[b]	1.1	1.1[c]	1.4
D. Negative alterations in cognitions and mood	Single	$H(2) = 47.3, p < .001$	11.1[a]	3.8	13.0[a]	4.3	1.9[b]	3.1
	Multi	$H(2) = 42.6, p < .001$	13.3[a]	4.2	10.5[a]	4.4	2.5[b]	3.0
E. Alterations in arousal and reactivity	Single	$H(2) = 41.5, p < .001$	10.5[a]	2.3	11.1[a]	3.2	2.5[b]	3.2
	Multi	$H(2) = 36.6, p < .001$	11.9[a]	3.5	9.5[a]	3.9	3.2[b]	3.2

Note. Superscript letters represent significant between group differences. ASPECTS – PTSD-DS (*n* = 10), PTSD-ND (*n* = 7), no diagnosis (*n* = 217). C-CATS – PTSD-DS (*n* = 9), PTSD-ND (*n* = 11), no diagnosis (*n* = 90). Groups were determined by self-report questionnaires (CPSS for ASPECTS, CATS for C-CATS). *M* = mean; *SD* = standard deviation.

Once again, the exploratory analysis in Table 11 was frustrated by low sample sizes in the diagnostic groups and, as detailed in Chapter 4, the comparisons between diagnostic groups were not adequately powered to detect even a large effect. Effect sizes for all comparisons were therefore calculated (see Table 12). Specifically with regard to comparisons between the diagnostic groups, non-statistically significant comparisons yielded small to large effect sizes (Cohen's *D* range = 0.22-1.17). This therefore suggests that the comparisons between the PTSD-ND and PTSD-DS groups were under-powered, and this may have skewed the findings.

Table 12

Between group effect sizes for diagnostic groups by the DSM-5 PTSD diagnostic criteria

following both single- and multi-event trauma (ASPECTS & C-CATS respectively)

		Effect Size		
	Trauma type	PTSD-DS vs PTSD-ND	PTSD-DS vs no diagnosis	PTSD-ND vs no diagnosis
B. Reexperiencing	Single	-1.17	2.48	3.00
	Multi	0.89	2.10	1.52
C. Avoidance	Single	-0.29	3.10	3.24
	Multi	1.06	2.62	1.91
D. Negative alterations in cognitions and mood	Single	-0.47	2.65	2.96
	Multi	0.65	2.96	2.12
E. Alterations in arousal and reactivity	Single	-0.22	2.87	2.69
	Multi	0.65	2.59	1.77

Note. All effect sizes are Cohen's D. ASPECTS – PTSD-DS ($n = 10$), PTSD-ND ($n = 7$), no diagnosis ($n = 217$). C-CATS – PTSD-DS ($n = 9$), PTSD ($n = 11$), no diagnosis ($n = 90$).

Discussion of Additional Exploratory Analyses

The only criteria which successfully differentiated the diagnostic groups was Criterion B specifically following single-event trauma (ASPECTS), where PTSD-DS was associated with lower scores, and Criterion C specifically following multi-event trauma (C-CATS), where PTSD-DS was associated with higher scores. This contrasts evidence from other studies where an association has been found between PTSD-DS and re-experiencing, specifically with flashbacks (Stein et al., 2013; Wolf, Miller et al., 2012). The bi-directional nature of the results across nearly all factors between the single- and multi-event trauma samples might suggest that dissociative reactions in the context of PTSD are more problematic following multi-event trauma compared to single-event trauma. Alternatively, dissociation may just represent a subtle phenomenon that is challenging to measure and define. No firm conclusions can be drawn due to the low powered comparative analysis between the diagnostic groups.

Assumptions for Multiple Hierarchical Regression Modelling

As described in Chapter 4, a multiple hierarchical regression analysis was used to assess the predictive ability of dissociation on PTSS over and above other cognitive processing factors, and the predictive ability of dissociation on functional impairment over and above PTSS. Prior to the completion of these two analyses, checks were made to ensure that the assumptions were met for multiple hierarchical regression modelling. The assumptions are as follows: linearity of relationships between predictors and outcome variables; normality of error terms; homoscedasticity indicating constant variance of error terms; and no multicollinearity of predictor variables (UCLA Statistical Consulting Group).

Scatterplots with lines of best fit were used to confirm that relationships between independent and dependant variables were linear. Multicollinearity between predictor variables was assessed using pairwise correlation coefficients, where $r > 0.7$ was considered to indicate a high degree of correlation. There was no evidence of multicollinearity using this method and following inspection of the tolerance statistics (all < 0.259) and variance inflation factors (all > 3.865). Additionally, all correlations between independent and dependent variables were greater than 0.3.

The assumption of multivariate normality was investigated by checking that residuals were normally distributed, that there was limited deviation from a straight line in p and q normal plots, and by applying Shapiro-Wilk W tests (Shapiro & Wilk, 1965). Due to evidence of some heteroscedasticity, nonparametric adjustments were made by the use of bootstrapping (Chernick, 2008), where 2000 resamples were used (Efron & Tibshirani, 1993).

Chapter 7. Discussion and Critical Evaluation

This last chapter firstly presents a broad overview of the findings from both the systematic review and empirical studies. Following this, both studies are critically appraised and their strengths and limitations discussed. Both clinical and theoretical implications are examined, followed by considerations for future research. The author's reflections on the process of completing this thesis portfolio and an overall conclusion is presented.

Main Findings

Systematic Review

The aim of the systematic review was to address the lack of consensus regarding prevalence of PTSD-DS and associated risk factors (Hansen et al., 2017). The review encompassed a broad range of studies that used different methods to estimate prevalence, ultimately pooling these results to provide an overall summary value for the point prevalence of PTSD-DS. To the author's knowledge, the review was the first of its kind to meta-analyse the prevalence of PTSD-DS in participants with PTSD whilst assessing the impact of moderators on PTSD-DS prevalence, furthering the work of Hansen et al. (2017) following their systematic review.

Forty-nine studies were included in the meta-analysis, four of which were divided into two samples due to different participant characteristics, index traumas or analyses. This left 53 samples included in this review ($N = 8214$ participants). The estimated pooled prevalence of PTSD-DS in children and adults, as a proportion of those with PTSD, was: 38.1% [95% confidence intervals (CI) 31.5–45.0%], 45.5% (95% CI 37.7–53.4%) across samples which used diagnosis-based and clinical cut-off methods, 22.8% (95% CI 14.8–32.0%) across latent class analysis (LCA) and latent profile analysis (LPA) samples, and 48.1% (95% CI 35.0–61.3%) across samples which strictly used the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders [DSM-5; American Psychiatric Association (APA); 2013] PTSD criteria. As this was the first meta-analysis of its kind,

making comparisons with the wider literature and other reviews was challenging.

However, the prevalence of PTSD-DS for the LCA and LPA studies was similar to the

average prevalence calculated by Hansen et al. (2017), which is not unexpected given both

reviews analysed similar studies. It was surprising, however, that such relatively high

prevalence rates were ascertained, especially given the perception that dissociative

symptoms are rare in the context of PTSD (Lanius et al., 2014). This perhaps suggests that

dissociative symptoms are more prevalent following traumatic exposure than previously

thought.

The difference between the estimated prevalence of PTSD-DS in children and

adults for the diagnostic and clinical cut-off samples and that of the LCA and LPA samples

was found to be significant. This highlighted that the method of prevalence estimation

impacts the value of estimated prevalence of PTSD-DS, and more exploratory methods

such as LCA and LPA result in significantly lower prevalence rates than diagnostic or

clinical cut-off analyses. To the author's knowledge, no studies have compared the

estimation of prevalence between diagnostic, clinical cut-off, and LCA and LPA methods.

The systematic review in Chapter 2 described two studies where sets of data that were

analysed twice, once using diagnostic criteria and second by LCA (Choi et al., 2017; 2019;

Hansen et al., 2019). In both cases, the prevalence determined by diagnostic criteria was

greater than when determined by LCA. Bauer and Curran (2004) have questioned the

validity and reliability of LCA and LPA, given they are data-driven approaches, and

therefore any classes or profiles are statistical constructs rather than nosological subgroups.

Achterhof et al. (2019) also questioned the use of LCA, as the authors found classes were

not always distinctly separated from each other. What is clear from the systematic review

is that different methods of prevalence estimation result in varying estimates of prevalence

of PTSD-DS; a consideration for future research into the prevalence of PTSD-DS.

The only significant moderator analysis that yielded a significant result was when

the data were split according to participant age group (child versus adult). All other

moderator analyses yielded non-significant results indicating no evidence for differences between the estimated prevalence of PTSD-DS. This is surprising given that other studies have found multiple mediating and risk factors in relation to PTSD-DS (Hansen et al., 2017; Schiavone et al., 2018 for reviews), however, this may have been due to a lack of power that frustrated the moderator analyses. Despite the limited number of studies which estimated the prevalence of PTSD-DS in children, the prevalence was significantly higher in children compared to adults. This finding could be justified in the context of the trauma model of dissociation (Nijenhuis et al., 1998; Putnam, 1985; 1997; Spiegel, 1984; Spiegel & Cardeña, 1990; van der Kolk, 1987; van der Kolk & van der Hart, 1989), in that dissociation may be a more adaptive and suitable strategy in children for avoiding cues related to the traumatic event compared to adults. For example, if a trauma was perpetrated in the child's home, a child might have less resource to find other forms of coping when living in the setting where the trauma took, or continues to take, place is a constant reminder of the trauma (Choi et al., 2019). Dissociation, unknowingly on the part of the child, might offer some relief and a method of escape from the overwhelming affect associated with cues relating to the trauma. Unfortunately, the prevalence of PTSD-DS in children following different forms of trauma could not be compared due to a lack of studies and power, but this could form the basis for future research.

No statistically significant differences were identified following the moderator analyses when the data were split according to whether dissociation was determined via the DSM-5 criteria (depersonalisation and or derealisation) or by broader dissociation criteria. No conclusions can be drawn as to whether it would be more or less appropriate for the PTSD-DS criteria stipulated in the DSM-5 or a different approach to be utilised on the basis of this result alone. However, it does not seem to matter how dissociation is defined when determining the prevalence of PTSD-DS. This raises questions about the strict nature of the DSM criteria when defining this subtype (Ross, 2021).

As indicated in the systematic review, there was a high degree of between study heterogeneity throughout. There is evidence that diagnostic and clinical cut-off analyses can create heterogeneous subtypes (Dowdy & Kamphaus, 2007). Moreover, when using LCA and LPA methods, the researcher must decide which class solution to proceed with. As this is subjective, the results of a LCA or LPA study may not always be replicable (van de Schoot et al., 2017). These methodological issues only further promote between study heterogeneity. Overall, given the sensitivity and moderation analyses failed to reduce the level of heterogeneity, PTSD-DS remains an elusive construct that is challenging to define, and it is still unclear what factors moderate prevalence of this subtype of PTSD.

Empirical Study

The empirical study sought to address the lack of research into child and adolescent PTSD-DS following different forms of trauma and had several aims. The first aim was to establish the point prevalence of PTSD-DS in the first months following single-event trauma and following chronic multi-event trauma. A second aim was to investigate the course of PTSD-DS and how well early PTSD-DS predicted later PTSD, both following single-event trauma. Thirdly, the study aimed to investigate whether dissociation accounted for unique variance in post-traumatic stress symptoms (PTSS) over and above the effect of other post-trauma cognitive processing factors, and accounted for unique variance in functional impairment over and above the effect of PTSS. A final aim was to investigate whether PTSD-DS, non-dissociative PTSD (PTSD-ND) and no diagnosis groups differed across demographic, trauma, psychopathology, post-trauma cognitive processing, and functional impairment factors. The rationale for this investigation is a lack of understanding around the aetiology and impact of PTSD-DS in children and adolescents following experiences of single- and multi-event trauma. It was therefore hoped that a meaningful and valuable contribution could be made to the existing literature on PTSD-DS in children and adolescents, informing future research and clinical practice.

The absolute prevalence of PTSD-DS was low (3.8% nine weeks after single-event trauma, 8.2% following multi-event trauma; both relative to those who were exposed to trauma); however, a significant proportion of children who had a diagnosis of PTSD also had PTSD-DS (40.0% nine weeks after single-event trauma, 45.0% following multi-event trauma). This relative prevalence of PTSD-DS in children was higher than the pooled estimate of prevalence in adults reported in the systematic review, although as discussed, the prevalence rates found in the empirical study fell within the 95% confidence intervals for the prevalence of PTSD-DS found in adults when the DSM-5 PTSD criteria was rigorously applied (see Appendix E for supplementary table). However, the higher prevalence in children is nonetheless suggestive that PTSD-DS is more common in children and adolescents than adults. It was discussed that symptoms of dissociation (depersonalisation and derealisation), stipulated as criteria in the DSM-5, may not be specific enough indicators of PTSD-DS in children, in contrast to adults (Kerig et al., 2016). The proposed 'rare' dissociative subtype of PTSD (Lanius et al., 2012) appears more common in children, possibly indicating that depersonalisation and derealisation are more frequently endorsed symptoms in children than adults (Carlson et al., 2009). Significant recovery was seen in the prevalence of PTSD-DS without intervention following single-event trauma, which lends further evidence that the course of dissociative symptoms is consistent with the natural reduction of PTSS over time (Blanchard et al., 1996; Riggs et al., 1995; Rothbaum et al., 1992).

Furthermore, PTSD-DS at two-weeks post single-event trauma was no more predictive of PTSD at nine weeks, and was considerably less sensitive, compared to PTSD at two weeks post single-event trauma. Dissociation has been found to not be predictive of later PTSD (Bryant et al., 2007; Dalgleish et al., 2008; Meiser-Stedman et al., 2005), and perhaps dissociation is a routine and predictable symptom in the immediate aftermath of a traumatic experience, therefore not indicating a more severe PTSD. Additionally, dissociation accounted for little to no additional variance in both PTSS and functional

impairment, over and above other post-trauma cognitive processing factors and PTSS. Whilst persistent dissociation appeared to play a role in increasing PTSS, this effect was little more significant than negative appraisals or memory quality. It must therefore be concluded that dissociation in the context of PTSD may not present as a particularly concerning feature, given it appears to play a limited part in predicting either PTSS or functional impairment.

Following a final exploratory analysis where PTSD-DS, PTSD-ND and no diagnosis groups were compared across a range of factors. The main finding was that both diagnostic groups scored significantly higher in areas of psychopathology, post-trauma cognitive processing, and functional impairment, compared to non-diagnostic controls in most cases. Therefore, despite all children having experienced some form of traumatic exposure, those children with PTSD-ND and PTSD-DS were significantly more pathological and impaired compared to those who did not meet the criteria for PTSD-DS. Regarding the comparisons between diagnostic groups, PTSD-DS was found to be associated with: male sex and poorer memory quality following both multi-event and mixed trauma; increased PTSS, anxiety, depression, and more negative appraisals following multi-event trauma; and fewer instances of assault and less negative appraisals following single-event trauma. However, power analyses indicated that diagnostic group comparisons were significantly underpowered, limiting the ability to make firm conclusions on the basis of the results. Nonetheless, interesting results were found, and given the challenge of recruiting large groups of individuals with PTSD-DS, it was pertinent to report the results of the exploratory analyses despite the lack of power. The findings of this study offer support for the applicability of the cognitive model (Ehlers & Clark, 2000) to this PTSD subtype, as with PTSD (Hiller et al., 2021), and highlight the importance of more negative appraisals and poorer and more fragmented trauma memories in the maintenance of PTSD-DS. Impairments in memory have long been attributed as a symptom of dissociation (Lanius et al., 2012; McKinnon et al., 2016).

It was particularly striking that the PTSD-DS group scored more highly on measures of psychopathology, post-trauma cognitive processing, and functional impairment following multi-event trauma compared to the PTSD-ND group, whereas the opposite was true following single-event trauma. Perhaps in the early stages following single-event trauma (i.e., the experience of participants in the ASPECTS study), dissociation in children reflects initial processing difficulties rather than a persistent maladaptive response. Equally, PTSD-DS may represent a more pathological form of PTSD in children following multi-event trauma, where there is an increased use of post-trauma cognitive processes such as negative appraisals and fragmented memory. Dissociative coping following chronic childhood maltreatment has been detailed in the extant literature (Liotti, 2004; Putnam, 1997); children who have suffered chronic maltreatment may have fewer opportunities to escape home and caregiver related traumatic stressors, and therefore dissociation presents as a successful way of reducing distress and coping in the short-term (Choi et al., 2019). However, these are tentative hypotheses, and further research is required to investigate these fully, comparing PTSD-ND and PTSD-DS groups in larger samples.

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Strengths and Limitations

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Systematic Review

The available literature describing the prevalence of PTSD in children and adults was comprehensively consolidated following a rigorous search strategy and screening of papers. The benefit of using meta-analysis methodology was that it provided a weighted pooled estimate of the point prevalence of PTSD-DS; a first in the published literature. This review also took a broad approach by summarising and distinguishing between multiple methods of PTSD-DS prevalence estimation. A quality assessment framework was used to gauge and consider the impact of risk of bias in relation to the prevalence of PTSD-DS. Quality assessment frameworks are not consistently used in meta-analyses, but are an important part of the review process to assess the impact of study quality on the

results (Cuijpers, 2016). Conducting sensitivity analysis and meta-regressions, removing

studies considered at high risk of bias, showed that study quality had no impact on the

overall prevalence estimate for PTSD-DS. Additionally, use of funnel plots and assessment

of publication bias provided reassurance that it was unlikely studies were missing that may

have not been published.

There were also several limitations of the systematic review. Very stringent

exclusion criteria were applied during the study screening process, which is also

considered a strength. However, PTSD-DS is associated with high degrees of psychiatric

comorbidity (Stein et al., 2013), and yet several studies where participants were recruited

on the basis of comorbid difficulties were not included in the systematic review. However,

it would have been challenging to account for the impact of comorbidity in studies where

participants were recruited specifically due to other diagnostic difficulties (Gidzgier et al.,

2019; Mergler et al., 2017; van Minnen et al., 2016). The search strategy had in any case

already elucidated a large number of studies, and any more would have been

unmanageable for inclusion in a single review within the constraints of a thesis portfolio as

part of a Doctorate in Clinical Psychology.

Whilst a relatively high number of studies were included in the review, some

moderator analyses lacked power due to paucity of appropriate samples. Further planned

moderator analyses investigating the influence of sex, time between index trauma and

PTSD assessment, single- versus multi-event traumas, and individual versus collective

trauma were therefore not possible. Additionally, multiple underpowered meta-regression

analyses may be more likely to output false-positive results (Hedges & Pigott, 2004;

Higgins & Thompson, 2004), which may have affected some analyses. There is scope for

further research to investigate moderators not covered in this study.

A considerable degree of heterogeneity was found between studies in the meta-

analysis regarding the prevalence of PTSD-DS, which reduced the generalisability of the

findings. Higgins et al. (2003) state that around a quarter of meta-analyses describe I^2

statistics of greater than 50%, indicating that high degrees of heterogeneity are common in psychological research (Cuijpers, 2016; Engels et al., 2000; Higgins, 2008). However, it is unlikely this heterogeneity occurred by chance and instead may reflect the construct being investigated. It may be that criteria for PTSD-DS are not specific enough to define a pool of individuals that can be considered homogenous between studies. Therefore, whilst the high degree of heterogeneity is a limitation of this study, it also raises questions around the validity of an underlying diagnostic dissociative subtype.

Finally, most studies were conducted in high income countries, and all were written in English; therefore, the results are not generalisable globally. Conclusions made should therefore be viewed through the lens of this limitation.

Empirical Study

A real strength of the empirical study was the opportunity to further evaluate two pre-existing longitudinal datasets, in which children were demographically comparable despite being from different parts of the UK, the methodologies were comparable, and the types of trauma were so contrasting. The systematic review in Chapter 2 specifically highlighted how PTSD-DS has not been researched in children to the same extent as in adults, and how there is a significant difference in the prevalence of PTSD-DS in children and adults. The Acute Stress Programme for Children and Teenagers study (ASPECTS; Meiser-Stedman et al., 2017) and Coping in Care After Trauma study (C-CATS; Hiller et al., 2021) datasets enabled further investigation of PTSD-DS in children and adolescents and address a gap in the literature. The ASPECTS and C-CATS datasets are the two largest in the UK where the largest study globally is Choi et al. (2017; 2019). Therefore, the empirical paper presents a step forward in the investigation of PTSD-DS in children and adolescents, and is the first to assess PTSD-DS in two populations of children following single-event and multi-event trauma. The empirical study is therefore a novel piece of work which will contribute to the ongoing debate about dissociative symptoms following PTSD. The scale of data available from these two existing research projects was far greater

than that which could have been obtained within the constraints of a Doctorate in Clinical

Psychology. Overall sample sizes in both ASPECTS and C-CATS studies, where data was

captured over a two-month and 12-month longitudinal timeframe respectively, far

exceeded what would have been possible in the limited time afforded to completing a

research project on the Doctorate in Clinical Psychology. Having access to such large

datasets allowed for consideration of exactly which research questions would be most

appropriate and helpful to address, and to plan more sophisticated data analyses. Finally,

using pre-existing datasets gave more time to complete a broad and comprehensive

systematic review and meta-analysis, leading to a more comprehensive and adventurous

review than would otherwise have been possible. Assumptions for statistical testing were

rigorously observed and, where violations did occur, the use of non-parametric alternatives

and bootstrapping techniques produced more reliable results.

There were several limitations associated with the empirical paper. Firstly, whilst

the use of two datasets was advantageous in many ways, it also presented some challenges.

Whilst the ASPECTS study used both semi-structured interviews and self-report measures

to assess PTSD, the C-CATS study only used self-report measures. Therefore, the

prevalence of PTSD in the empirical study should be treated with caution as statistics are

based on self-report measures. The variables PTSS, and anxiety and depression, were

measured using different outcome measures in the ASPECTS and C-CATS studies,

limiting the ability to compare these factors between the two datasets. Additionally, the

ASPECTS and C-CATS studies represented two different geographic locations in the UK,

limiting the generalisability of the findings.

Despite large sample sizes in both the ASPECTS and C-CATS studies of children

who had either experienced single-event trauma or been removed from their family home

and were under the care of a local authority, the proportion of children with PTSD was

relatively small, and the proportion with PTSD-DS even smaller again. This led to the

diagnostic group comparison being frustrated by a lack of power. There is therefore a need to replicate this method and analysis using larger samples.

Another limitation was that all outcome measure responses were child-report. Whilst Meiser-Stedman, Smith, Glucksman et al. (2007) recommend child self-report when reporting on internal states, Hiller et al. (2021) found there was poor agreement between social worker, carer and child report on maltreatment history and total symptoms, where children underreported on symptoms compared to carer-report. Future studies should therefore consider obtaining data from multiple sources, and comparing data from children versus carer report, as in Hiller et al. (2021).

Furthermore, some measures were developed specifically for the single-event trauma study (ASPECTS) where construct validity could not be assessed. Some measures in both ASPECTS and C-CATS also lacked sensitivity, most notably measures of functional impairment and self-blame.

Finally, both ASPECTS and C-CATS studies only included participants who spoke English proficiently. Whilst this served to protect participants by ensuring that they were able to provide informed consent to take part in the research, it means that the results are not generalisable.

Clinical Implications and Theoretical Implications

Following completion of the systematic review and empirical study, it has become clear that dissociative symptoms are commonly endorsed in the context of PTSD, especially in children. It does not appear, however, at least on the basis of the research conducted in this thesis portfolio, that dissociative PTSD is indicative of more severe PTSD overall. Additionally, the empirical study showed that there is significant natural recovery in PTSD-DS following a single-event trauma, and therefore periods of watchful waiting may be important before commencement of psychological therapy in child cases of single-event trauma. Similar conclusions cannot be drawn on the basis of child cases following multi-event trauma. Clinicians should assess for a range of dissociative

symptoms, given how prevalent they have been shown to be in the context of PTSD in the

systematic review, and given there is an association between dissociation and self-harm

(Rossi et al., 2019). Hoeboer et al. (2020) recently concluded that there was no evidence to

suggest that dissociation impacts the efficacy of PTSD psychotherapy. Clinicians therefore

should be tasked with continuing to support individuals with PTSD, regardless of the

presence of symptoms of dissociation. However, if a young person does not appear to

respond well to psychotherapy on account of dissociation, perhaps a differentiated

approach could be provided. Exposure based therapies are often used to treat PTSD

symptoms, and dissociation can impact the connection with the present moment during the

process of reliving traumatic memories (Jowett et al., 2022) and create avoidance (Murray

et al., 2022). Adaptations to therapy could include using reminders of the present such as:

objects or sensory experiences, keeping eyes open at all times, speaking in past tenses,

regular therapist verbal communication, and via the use of narrative rather than imaginal

reliving (Murray et al., 2022). The use of treatment methods such as trauma-focussed CBT

should focus on cognitive mechanisms such as fragmented memories and negative

appraisals, as per the cognitive model of PTSD (Ehlers & Clark, 2000), especially given

they have been shown to be the most significant predictors of PTSS (as shown in the

empirical paper). It might be useful for clinicians to also consider methods that focus on

the re-processing of trauma related memories and on persistent dissociation, as both these

factors accounted for variance in PTSS in children.

Whilst this thesis portfolio did not specifically address the research question

regarding which model of dissociation is most appropriate in the context of PTSD, the

overall results do not offer support to the Subtype Model (i.e., where it is posited that

increased levels of dissociation change the symptomology of the PTSD itself, and where

the subtype is related to specific clinical characteristics and comorbidities that differ from

that of 'classic' PTSD; Dalenberg & Carlson; 2012). Given this piece of research identified

relatively high prevalence of PTSD-DS, especially in children, dissociation appears to

form a prevalent constituent part of the overall PSTD presentation. In fact, Ross (2021) proposed an alternative view; that is, dissociative PTSD constitutes the 'classic' and typical diagnosis, whereas PTSD-ND could be considered the subtype. The research conducted in this thesis suggests dissociation is not so rare that it warrants the formation of a subtype. Viewing dissociation as a routine and normal part of PTSD symptomology may support clinicians to view it as less of a barrier to efficacious interventions.

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Future Research Directions

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Completion of this thesis portfolio identified many areas that future research could explore further, particularly as PTSD-DS is still a relatively new diagnosis and is not well understood. Unfortunately, there is a dearth of research investigating PTSD-DS in children compared to adults (Choi et al., 2019), and the applicability of evidence to children based on the adult literature should not be assumed (Ross, 2020). This is because research suggests that dissociative symptoms are more subtle in children compared to adults and symptoms can be misinterpreted as inattention (Dalenberg, Brand et al., 2012), dissociation is often missed diagnostically (Berenson, 1998; Grasso et al., 2009), and children may lack the awareness that their dissociative symptoms are atypical (Dalenberg, Brand et al., 2012) which has implications for accuracy of reporting. Additionally, it has been questioned whether dissociation should be viewed as a continuum rather than dichotomously (Carlson et al., 2009), as it is not clear which elements of dissociation should be considered pathological across development (Hornstein & Putnam, 1992; Putnam, 2000; Silberg & Dallam, 2009). Finally, as in adult studies, other domains of dissociation (other than just depersonalisation and derealisation) have been found to be prominent for children (i.e., dissociative amnesia and dissociative avoidance; Choi et al., 2017). Therefore, it is important to build a strong foundation of literature around dissociation and PTSD in children, to investigate these areas in more detail to help determine whether the current diagnostic criteria reliably and validly determine a dissociative subtype of PTSD in children.

If the presumption can be made that diagnostic criteria are valid descriptions of PTSD-DS across development, then further research is required to determine why it is that children are more pathologically dissociative in the context of PTSD compared to adults, as indicated by the high prevalence indicated in both the systematic review and the empirical paper. Is it that dissociation offers an adaptive way of responding to trauma in childhood when the experience of affective and cognitive dysregulation is too overwhelming (Carlson et al., 2009; Kerig & Bennett, 2013; Putnam, 1997), or is it that childhood interpersonal trauma and maltreatment are strongly associated with dissociative symptoms (Irwin, 1999; Sanders & Giolas, 1991) and therefore the prevalence of PTSD-DS is greater in children? Further research needs to build on the work conducted so far to continue to develop our understanding.

In addition to the recommendations made throughout this chapter, PTSD-DS should be explored in larger, more diverse samples including, for example, children of different ages and who have experienced different forms of traumatic exposure. Future studies should look to standardise methods of PTSD-DS assessment, for example, LCA and LPA studies should look to use the same mental health indicators, so that comparisons between studies can be made more successfully. Future researchers should be encouraged to relax the inclusion and exclusion criteria (Ronconi et al., 2014) and explore PTSD-DS in naturalistic samples where there may be comorbidities, for example. Further research is also required to establish if there are particular risk factors associated with PTSD-DS (for example trauma chronicity and type).

Reflections on the Process of Completing the Thesis Portfolio

The author's motivation for writing a thesis portfolio in the area of PTSD was driven by experience of working in schools and screening children and parents for PTSD after the Grenfell Tower Fire disaster in 2017. The author was struck by the resilience of local families in the immediate aftermath of the fire, and it fostered a real interest in post-traumatic stress.

The start of the COVID-19 pandemic shortly following the research fair in 2020 caused some challenges in choosing and designing a project to complete as part of the Doctorate in Clinical Psychology. It was fortunate that no data was needed to be collected first-hand for the empirical paper, which meant that the pandemic had little impact on completion of this thesis portfolio. However, not collecting data personally may have prevented development of qualitative insight into the experiences of children following traumatic exposure, which may have aided interpretation of results. However, secondary analysis of data afforded the opportunity to view the data objectively, reducing likelihood of researcher bias.

Whilst ethical approval was not required for the completion of the secondary analysis of data for the empirical paper, the ethics of using these data was further considered. As a large volume of data had been collected for both the ASPECTS and C-CATS studies, it was felt ethically and morally prudent to maximise the use of these data for further research. Many children took part in these research studies having experienced a range of traumas and it felt appropriate to make the most of the data derived from these experiences and recognise the efforts of those children who opted to take part, and to avoid a 'file-drawer' issue. For relevant ethics approval forms for both ASPECTS and C-CATS studies, see Appendix T and U.

The process of submitting the systematic review to *Psychological Medicine* prior to submission of the thesis, and preparing to submit the empirical paper to a journal immediately post submission of the thesis portfolio, is a further opportunity to reflect. Selecting a journal with the widest reach and readership, whilst also accounting for likelihood of acceptance and interest on the part of the editor, was an engaging and useful exercise. However, it was the process of involving the wider research team who offered peer review feedback which proved to be especially helpful in obtaining external objective comments from experienced researchers in the field of PTSD. Feedback at an early stage

helped to hone the papers and ensure that they were of a standard suitable for publication. Appendix V details the cover letter sent to *Psychological Medicine* for their consideration.

Overall Conclusion

The systematic review and empirical study presented clinically and theoretically interesting findings which contribute to and inform the ongoing discussion around PTSD-DS in children and adults following experience of different forms of trauma. In particular, the findings indicated that PTSD-DS is prevalent, especially in children and adolescents. The results of the empirical paper additionally suggested that PTSD-DS follows a similar trajectory of natural recovery to PTSD, and it does not appear to additionally indicate later PTSD following single-event trauma. Furthermore, dissociation does not seem to be a significant factor associated with PTSS or functional impairment following either single- or multi-event trauma. Therefore, whilst PTSD-DS is a common in those with PTSD, it may offer little clinical utility to the extant PTSD diagnosis in children and adolescents, and may simply be a routine component of the PTSD presentation. However, the results presented in this thesis portfolio should be viewed with caution due to limitations in both studies. Further research is warranted into PTSD-DS following different forms of trauma and in larger samples of participants. In particular, future studies should aim to identify factors that moderate the prevalence of PTSD-DS, and identify both risk and maintenance factors. Finally, it would be useful to determine whether a dissociative subtype is warranted for inclusion in the diagnostic criteria, or whether dissociation should be considered a routine part of the PTSD presentation.

Dalenberg, Glaser et al. (2012) made the argument that clinical meaningfulness is required to justify the inclusion of a PTSD subtype, specifically when a subtype is related to increased functional impairment and different risk factors. Given the evidence presented in this thesis portfolio, the dissociative subtype may not be particularly clinically meaningful or warranted; therefore, it is hard to justify the inclusion of a dissociative

subtype in the diagnostic criteria in addition to the diagnosis of PTSD. As Achterhof et al.

(2019) stated, "diagnostic utility does not equal ontological truth" (p. 10).

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Appendices

Appendix A – Author Guidelines for Psychological Medicine

Instructions for authors

Jump to:

Manuscript Submission
Required Statements
Production
Open Access
Author Support
Publication Ethics

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Editorial	3500	No	APA style	Usually up to 5 total	Yes
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Commentary	2000 By invitation of editor	No	max 20 APA style	Not usually	Yes

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Nevin, A. (1990). The changing of teacher education special education. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, 13*(3-4), 147-148. doi:XXX

Light, M. A., & Light, I. H. (2008). The geographic expansion of Mexican immigration in the United States and its implications for local law enforcement. *Law Enforcement Executive Forum Journal*, *8*, 73–82. doi:XXX

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Good, C. D., Johnsrude, I. S., Ashburner, J., Henson, R. N. A., Firston, K. J., & Frackowiak, R. S. J. (2001). A voxel-based morphometric study of ageing in 465 normal adult human brains. *NeuroImage, 14,* 21–36. Retrieved from http://xxxx

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In-press article
Briscoe, R. (in press). Egocentric spatial representation in action and perception. *Philosophy and Phenornenological Research*. Retrieved from http://cogprints.org/5780/l/EC...

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Last updated 2 January 2020

Appendix B – Systematic Review Supplementary Table 1

Quality Assessment Checklist for Prevalence Meta-Analysis

1	Was the study population and index trauma clearly specified and defined?	
Descriptive statistics were reported on participant demographics (including age range and mean, gender, ethnicity) and frequency of trauma type/nature within the participant pool reported		2
Some descriptive statistics provided about the sample but some missing information (e.g., authors did not report frequency of trauma type/nature or provide enough information about demographic variables).		1
No clear description of sample demographics or index trauma characteristics		0
2	**Was the participation rate of eligible persons at least 50%?**	
More than 50% of eligible and approached participants took part		2
Less than 50% of those approached took part, but there was no significant difference in non-response characteristics (such as age, gender) between those who participated and those who did not		1
Less than 50% of those approached took part, and differences between those who took part and those who didn't were not reported or highlighted significant differences. Or, response was not reported		0
3	**Was follow up time for PTSD assessment appropriate and meaningful?**	
An appropriate time frame (>4 weeks) since trauma was reported		2
No information given regarding time frame since trauma. Or, assessment <4 weeks since trauma		0
4	**Were objective, standard criteria used for the assessment of Post-Traumatic Stress Disorder?**	
Diagnostic interview or self-report questionnaire shown to demonstrate good levels of validity and reliability in the assessment of PTSD adhering to DSM criteria for PTSD i.e., cluster-based algorithm		2
Diagnostic interview or self-report questionnaire shown to demonstrate good levels of validity and reliability in the assessment of PTSD adhering to DSM criteria for PTSD using a cut-off score or grouping analysis such as LCA or LPA		1
Diagnostic interview or self-report without utilising DSM criteria (e.g., not conforming to cluster-based algorithm or cut-off score or grouping analysis). Or poor validity and reliability.		0
5	**Were objective, standard criteria used for the assessment of the Dissociative Subtype of Post-Traumatic Stress Disorder?**	
Diagnostic interview or self-report questionnaire shown to demonstrate good levels of validity and reliability, adhering to DSM-5 criteria for PTSD-DS i.e., based on depersonalisation and derealisation only		2
Diagnostic interview or self-report questionnaire shown to demonstrate good levels of validity and reliability, however not adhering to DSM-5 criteria for PTSD-DS i.e., based on other domains of dissociation outside of just depersonalisation and derealisation		1
Diagnostic interview or self-report questionnaire shown to demonstrate good levels of validity, however domains of dissociation assessed not reported. Or poor validity and reliability		0

Note. Where 2 = well addressed, 1 = partially addressed, 0 = poorly addressed/not addressed/not reported

This tool was developed by Mr. William White for a systematic review and meta-analysis undertaken in partial fulfilment of a Doctorate in Clinical Psychology. The development of this tool was based on the Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart Lung and Blood Institute, 2014), combining with modified questions from other prevalence and risk factor studies that would be appropriate for use in this review (Hoy et al., 2012; Munn et al., 2014).
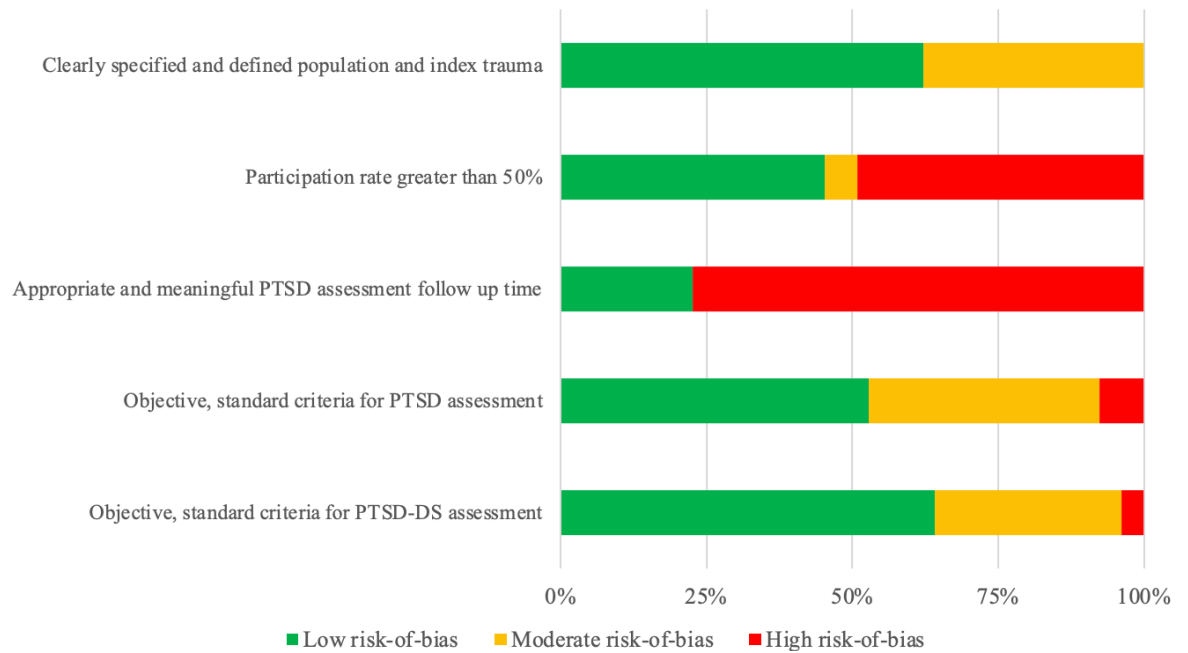
Appendix C - Systematic Review Supplementary Table 2

Sample risk-of-bias scores by individual item and total

Sample No.	Author	Item 1	Item 2	Item 3	Item 4	Item 5	Total	Quality
1	Abu-Rus et al. (2020)	1	2	0	2	2	7	High
2	Acar et al. (2019)	1	0	0	2	1	4	Low
3	Armour, Elklit et al. (2014)	2	2	2	1	1	8	High
4	Armour, Karstoft et al. (2014)	2	0	0	1	1	4	Low
5	Blevins et al. (2014)	2	0	0	1	2	5	Medium
6	Boysan et al. (2017)	2	0	2	2	2	8	High
7	Briere et al. (2005)	1	2	0	2	1	6	Medium
8	Burton et al. (2018)	2	0	0	1	2	5	Medium
9	Caroppo et al. (2021)	2	0	0	2	0	4	Low
10	Choi et al. (2019)	2	2	0	2	2	8	High
11	Choi et al. (2017)	2	2	0	1	2	7	High
12	Cloitre et al. (2012)	2	0	2	0	1	5	Medium
13	Criswell et al. (2018)	2	0	2	2	2	8	High
14	Daniels et al. (2016)	1	0	0	1	2	4	Low
15	Dorahy et al. (2017)	1	1	0	0	1	3	Low
16	Durham et al. (2020)	2	2	0	1	2	7	High
17	Eidhof et al. (2019)	2	0	0	2	2	6	Medium
18	Frewen et al. (2015)	1	2	0	1	2	6	Medium
19	Frewen et al. (2019)	1	0	0	2	2	5	Medium
20	Guetta et al. (2019)	1	2	0	1	2	6	Medium
21	Hansen, Hyland et al. (2016)	1	2	2	1	2	8	High
22	Hansen et al. (2019)	2	1	2	2	2	9	High
23	Hansen et al. (2019)	2	1	2	1	2	8	High
24	Hansen, Müllerová et al. (2016)	2	2	0	1	2	7	High
25	Hansen, Müllerová et al. (2016)	2	2	0	1	2	7	High
26	Harricharan et al. (2020)	1	0	0	1	2	4	Low
27	Hill et al. (2020)	1	0	0	1	2	4	Low
28	Kenny et al. (2020)	2	2	0	2	2	8	High
29	Kenny et al. (2020)	2	2	0	2	2	8	High
30	Kim et al. (2019)	2	2	0	2	2	8	High
31	Lebois et al. (2021)	1	2	0	2	2	7	High
32	Li et al. (2019)	2	2	0	2	1	7	High
33	Mulder et al. (1998)	2	2	0	2	1	7	High
34	Müllerová et al. (2016)	2	2	0	1	1	6	Medium
35	Naish et al. (2021)	2	0	2	2	2	8	High
36	Nejad et al. (2007)	2	0	0	0	1	3	Low
37	Özdemir et al. (2015)	2	0	0	2	1	5	Medium
38	Powers et al. (2017)	1	2	2	2	2	9	High
39	Putnam et al. (1996)	1	0	0	0	1	2	Low
40	Richard-Malenfant et al. (2019)	1	0	0	2	2	5	Medium
41	Ross et al. (2020)	2	2	0	2	2	8	High
42	Ross et al. (2018)	2	0	0	1	1	4	Low
43	Sierk et al. (2021)	2	2	2	2	1	9	High
44	Stein et al. (2013)	1	0	2	2	2	7	High
45	Steuwe et al. (2012)	1	0	0	2	2	5	Medium
46	Swart et al. (2020)	2	2	0	2	2	8	High
47	Tsai et al. (2015)	2	0	0	2	2	6	Medium
48	van der Kolk et al. (1996)	1	0	0	2	0	3	Low
49	Verbeck et al. (2015)	2	0	0	2	1	5	Medium
50	Wolf, Lunney et al. (2012)	1	0	0	1	1	3	Low
51	Wolf, Lunney et al. (2012)	1	0	2	1	2	6	Medium
52	Wolf, Miller et al. (2012)	2	2	0	1	1	6	Medium
53	Zoet et al. (2018)	2	2	0	1	2	7	High

Note. 0-4 high risk/low quality, 5-6 moderate risk/quality, 7-10 low risk/high quality

Appendix D - Systematic Review Supplementary Figure 1

Proportion of samples rated as a low, moderate or high risk-of-bias for each quality assessment item

Appendix E - Systematic Review Supplementary Table 3

Pooled point prevalence of PTSD-DS as a proportion of those with PTSD for diagnostic/clinical cut-off samples utilising DSM-5 criteria for dissociation (i.e., excluding LCA and LPA samples and those using broader criteria for dissociation; k = 23)

Meta-analysis subgroup	*k*	*n*	Pooled Prevalence (%)	95% CI	Q test	I^2
PTSD DSM criteria used[†] [β = -0.2041 (95% CI = -0.4406, 0.0324), p = 0.09]						
DSM-5	16	1180	48.2	(34.2, 62.3)	285.9[*]	95.5
DSM-III or DSM-IV	6	1926	28.3	(17.6, 40.3)	289.7[*]	96.1
Dissociation measure completion [β = 0.1271 (95% CI = -0.0882, 0.3423), p = 0.25]						
Self-report	10	1435	49.4	(32.0, 66.9)	174.5[*]	97.1
Interview	13	1804	36.4	(24.3, 49.4)	244.3[*]	96.3
Age group[‡] [β = 0.3444 (95% CI = 0.0410, 0.6477), p = 0.03]						
Child	4	949	62.9	(50.2, 74.7)	11.4[**]	82.0
Adult	16	1867	36.7	(24.7, 49.6)	376.3[*]	96.4

Note. k = number of samples; *n* = number of participants; CI = confidence interval

* p < 0.0001, where the degrees of freedom (*df*) = *k* – 1

** p < 0.01, where the degrees of freedom (*df*) = *k* – 1

† Sample 26 removed as used both DSM-IV and DSM-5 when assessing for PTSD

‡ Several samples were removed due to populations formed of both children and adults, or age group not reported

Appendix F - Systematic Review Supplementary Table 4

Pooled point prevalence of PTSD-DS as a proportion of those with PTSD for all LCA &

LPA samples (i.e., excluding diagnostic and clinical cut-off samples; k = 17)

Meta-analysis subgroup	k	n	Pooled Prevalence (%)	95% CI	Q test	I^2
PTSD DSM criteria used [β = -0.0872 (95% CI = -0.3022, 0.1278), p = 0.43]						
DSM-5	8	1750	25.0	(10.9, 42.7)	328.5[*]	98.6
DSM-III or DSM-IV	9	2850	18.2	(10.1, 28.1)	196.8[*]	97.4
Dissociation criteria [β = -0.0648 (95% CI = -0.2912, 0.1616), p = 0.57]						
DSM-5 (Dereal / Depers)	11	3503	23.1	(11.3, 37.5)	311.3[*]	98.8
Broader dissociation	6	1634	18.0	(10.7, 26.7)	83.7[*]	94.6
Dissociation measure completion [β = 0.0940 (95% CI = -0.1589, 0.3468), p = 0.47]						
Self-report	13	3506	23.1	(12.6, 35.6)	429.9[*]	98.6
Interview	4	1094	15.9	(12.7, 19.3)	6.7	55.6
Occupation [β = -0.0532 (95% CI = -0.2918, 0.1853), p = 0.66]						
Military	5	1378	18.4	(12.9, 24.6)	32.0[*]	87.6
Civilian	12	3759	22.5	(11.3, 36.1)	429.7[*]	98.8

Note. k = number of samples; n = number of participants; CI = confidence interval; Dereal =

derealisation; Depers = depersonalisation

* p < 0.0001, where the degrees of freedom (df) = $k - 1$

Appendix G - Systematic Review Supplementary Figure 2

Funnel plot to assessing publication bias
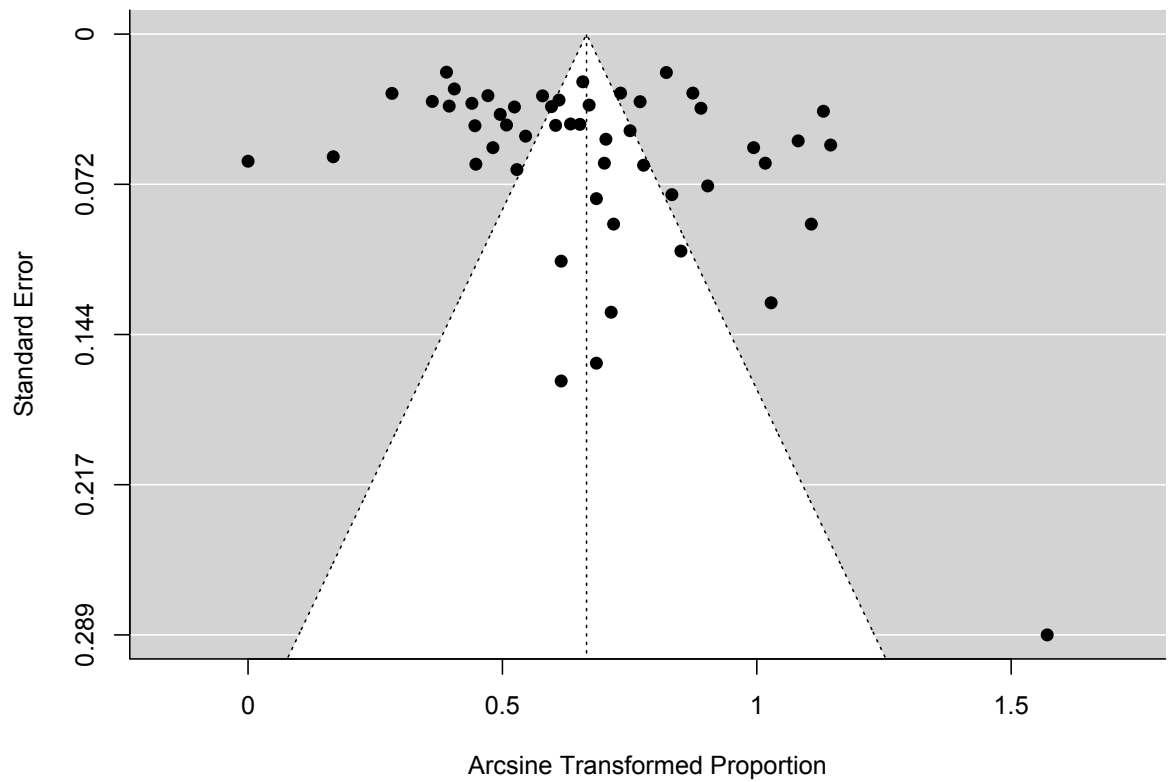
Appendix H – Author Guidelines for the British Journal of Clinical Psychology

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Author Guidelines updated 23 July 2021

Appendix I – Empirical Study Supplementary Table 1

Sample demographics for ASPECTS and C-CATS (relating to Tables 6-8)

	ASPECTS (single-event; *n* = 234)	C-CATS (multi-event; *n* = 110)
Age in years, *M* (*SD*)	14.0 (3.0)	13.4 (2.1)
Female	42.3%	51.8%
Ethnic minority	6.0%	9.1%
Days since trauma, *M* (*SD*)	67.3 (11.2)	1735.6 (1307.0)
Index trauma		
Assault	15.8%	-
Sexual abuse	-	42.7%

Note. *M* = mean, *SD* = standard deviation.

Appendix J – Empirical Study Supplementary Table 2

Additional Children's PTSD Inventory (CPTSDI) items

	DSM-5 Dissociation items	
3a)	SAY: Since the [trauma] happened, have you felt as if things around you weren't real?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
3b)	SAY: Since the [trauma] happened, have you felt as if you were in a dream or a movie?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
4a)	SAY: Since the [trauma] happened, have you felt as if you were outside your body?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
4b)	SAY: Since the [trauma] happened, have you felt as if your body doesn't really belong to you?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
4c)	SAY: Since the [trauma] happened, have you felt as if you're not really where you actually are?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]

	DSM-5 items	
1a)	SAY: Since the event, do you blame yourself for what happened in [EVENT], even though other people say it wasn't your fault?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been thinking this way for the past week?"	Yes [1] No [0]
1b)	SAY: Since the event, do you blame someone else for what happened in the event, even though other people say it wasn't their fault?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been thinking this way for the past week?"	Yes [1] No [0]
2a)	SAY: Since the event, do you feel scared a lot of the time?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been feeling this way for the past week?"	Yes [1] No [0]
2b)	SAY: Since the event, do you feel angry a lot of the time?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been feeling this way for the past week?"	Yes [1] No [0]
2c)	SAY: Since the event, do you feel guilty a lot of the time?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
2d)	SAY: Since the event, do you feel ashamed of yourself a lot of the time?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been feeling this way for the past week?"	Yes [1] No [0]
3a)	SAY: Since the event, do you think that the world is a very dangerous place now?	Yes [1] No [0]

	If "Yes" was indicated, SAY: "Have you been thinking this way for the past week?"	Yes [1] No [0]
3b)	SAY: Since the event, do you think that your life has been ruined by what happened in the event?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been thinking this way for the past week?"	Yes [1] No [0]
3c)	Since the event, do you find it hard to trust other people?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]
4a)	Since the event have you been doing more dangerous things?	Yes [1] No [0]
	If "Yes" was indicated, SAY: "Have you been doing this for the past week?"	Yes [1] No [0]

Appendix K – Empirical Study Supplementary Table 3

Additional Children's PTSD Symptom Scale (CPSS) items

DSM-5 items	*Not at all or only one time*	*Once a week or less/once in a while*	*2 to 4 times a week/half the time*	*5 or more times a week/ almost always*
Completely blaming myself or someone else for what happened.	[ ]	[ ]	[ ]	[ ]
Feeling scared, angry, guilty or ashamed a lot of the time.	[ ]	[ ]	[ ]	[ ]
Thinking that the world is very dangerous or that your life has been ruined by what happened.	[ ]	[ ]	[ ]	[ ]
Taking more risks and being reckless or dangerous.	[ ]	[ ]	[ ]	[ ]

Dissociation items	*Not at all or only one time*	*Once a week or less/once in a while*	*2 to 4 times a week/half the time*	*5 or more times a week/ almost always*
Being so shocked that I didn't feel anything	[ ]	[ ]	[ ]	[ ]
Not really noticing what was going on around me (like being in a bubble)	[ ]	[ ]	[ ]	[ ]
Feeling like I was in a dream	[ ]	[ ]	[ ]	[ ]
Feeling like I was outside my body, or that my body didn't belong to me	[ ]	[ ]	[ ]	[ ]

Appendix L – Empirical Study Supplementary Table 4

Self-blame items

	Disagree a lot	*Disagree a bit*	*Agree a bit*	*Agree a lot*
I made the event happen.	[ ]	[ ]	[ ]	[ ]
It was my fault the event happened.	[ ]	[ ]	[ ]	[ ]

Appendix M – Empirical Study Supplementary Table 5

Additional Child and Adolescent Trauma Screen (CATS) items

Dissociation items	Not at all or only one time	Once in a while	Some of the time	A lot of the time
I've been so shocked that I didn't feel anything	[ ]	[ ]	[ ]	[ ]
I've not really noticed what was going on around me (like being in a bubble)	[ ]	[ ]	[ ]	[ ]
I've felt like I was in a dream	[ ]	[ ]	[ ]	[ ]
I've felt like I was outside my body, or that my body didn't belong to me	[ ]	[ ]	[ ]	[ ]

Appendix N – Empirical Study Supplementary Table 10

Between group effect sizes for diagnostic groups by demographic, trauma,

psychopathology, post-trauma cognitive processing, and functional impairment factors

following both single- and multi-event trauma (ASPECTS & C-CATS respectively)

	Trauma type	Effect Size		
		PTSD-DS vs PTSD-ND	PTSD-DS vs no diagnosis	PTSD-ND vs no diagnosis
Demographic factors				
Age	Single	-0.30	0.26	0.52
	Multiple	-0.07	0.24	0.33
	Mixed	-0.12	0.19	0.30
Ethnic minority[†]	Single	0.00	0.57	0.00
	Multiple	1.33	0.58	2.32
	Mixed	0.94	0.54	1.73
Female Sex[†]	Single	3.00	3.06	0.98
	Multiple	-	1.09	-
	Mixed	7.58	1.72	4.40
Trauma type				
Assault (non-sexual)[†]	Single	2.50	0.14	17.59
Sexual abuse[†]	Multiple	2.19	0.94	2.33
Psychopathology				
PTSS	Single	-0.92	3.37	4.60
	Multiple	1.15	3.46	2.82
Anxiety	Single	-0.59	1.76	2.24
	Multiple	1.58	2.70	1.06
Depression	Single	-0.87	1.17	2.20
	Multiple	1.04	2.26	1.07
Post-trauma cognitive processing				
Memory quality	Single	-0.36	2.20	2.38
	Multiple	2.05	3.61	1.80
	Mixed	0.89	2.62	1.66
Negative appraisals	Single	-1.29	1.70	2.76
	Multiple	1.32	3.29	1.37
	Mixed	0.16	2.18	1.75

	Trauma type	Effect Size		
		PTSD-DS vs PTSD-ND	PTSD-DS vs no diagnosis	PTSD-ND vs no diagnosis
Self-blame	Single	1.45	0.76	-0.62
	Multiple	0.27	1.32	1.16
	Mixed	0.55	0.94	0.36
Functional impairment				
	Single	-0.18	1.84	2.72
	Multiple	0.26	1.47	1.35

Note. † Odds ratios. All other effect sizes are Cohen's *D*. Single-event trauma study (ASPECTS) – PTSD-DS (n = 10), PTSD-ND (n = 7), no diagnosis (n = 217). Multi-event trauma study (C-CATS) – PTSD-DS (n = 9), PTSD-ND (n = 11), no diagnosis (n = 90). Mixed trauma (ASPECTS & C-CATS) – PTSD-DS (n = 19), PTSD-ND (n = 18), no diagnosis (n = 307). Groups were determined by self-report questionnaires (CPSS for ASPECTS, CATS for C-CATS).

Appendix O – Empirical Study Supplementary Tables 6 & 7

Empirical Study Supplementary Table 6

Hierarchical regression model predicting PTSS (CPSS & CATS) at two weeks post trauma considering post-trauma cognitive processing factors and persistent dissociation at two weeks post trauma, following single-event trauma

Trauma type	Predictor variable	Model Adj. R^2	Model F test	Step ΔR^2	Step F test	Step 2 B	Step 2 Bootstrapped 95% CI	Step 2 β
Single-event trauma (ASPECTS; two weeks post-trauma)								
	Step 1: Post-trauma cognitive processing	.67	$F_{3,198} = 136.6, p < 0.001$	.67	$F_{3,198} = 136.6, p < 0.001$			
	Memory quality					**.53**	**(.34, .73)**	.29
	Negative appraisals					**.40**	**(.30, .49)**	.45
	Self-blame					-.07	(-.55, .42)	-.01
	Step 2: Persistent dissociation	.71	$F_{4,197} = 121.4, p < 0.001$	.04	$F_{1,197} = 25.4, p < 0.001$	1.33	**(.81, 1.85)**	.24

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Empirical Study Supplementary Table 7

Hierarchical regression model predicting functional impairment (CPSS and CATS) at two weeks post trauma considering the effect of PTSS and persistent dissociation at two weeks post trauma, following single-event trauma.

Trauma type	Predictor variable	Model Adj. R^2	Model F test	Step ΔR^2	Step F test	Step 2 B	Step 2 Bootstrapped 95% CI	Step 2 β
Single-event trauma (ASPECTS; two weeks post-trauma)								
	Step 1: PTSS	.36	$F_{1,202} = 115.1, p < 0.001$	.36	$F_{1,202} = 115.1, p < 0.001$	**.07**	**(.05, .09)**	.48
	Step 2: Persistent dissociation	.38	$F_{2,201} = 62.4, p < 0.001$	.02	$F_{1,201} = 6.6, p = 0.011$	**.14**	**(.03, .25)**	.19

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Appendix P – Empirical Study Supplementary Tables 8 & 9

Empirical Study Supplementary Table 8

Hierarchical regression model predicting PTSS (CPSS & CATS) at nine weeks post trauma considering post-trauma cognitive processing factors and persistent dissociation at two weeks post trauma, following single-event trauma

Trauma type	Predictor variable	Model		Step		Step 2		
		Adj. R^2	F test	ΔR^2	F test	B	Bootstrapped 95% CI	β
Single-event trauma (ASPECTS; variables at two weeks predicting PTSS at nine weeks post-trauma)								
	Step 1: Post-trauma cognitive processing	.59	$F_{3,197} = 93.2, p < 0.001$	.59	$F_{3,197} = 93.2, p < 0.001$			
	Memory quality					**.30**	**(.09, .50)**	.18
	Negative appraisals					**.40**	**(.30, .50)**	.51
	Self-blame					-.27	(-.77, .23)	-.05
	Step 2: Persistent dissociation	.62	$F_{4,196} = 78.4, p < 0.001$	.03	$F_{1,196} = 14.7, p < 0.001$	1.04	**(.50, 1.57)**	.21

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Empirical Study Supplementary Table 9

Hierarchical regression model predicting functional impairment (CPSS and CATS) at nine weeks post trauma considering the effect of PTSS and persistent dissociation at two weeks post trauma, following single-event trauma.

| Trauma type	Predictor variable	Model		Step		Step 2		
		Adj. R^2	F test	ΔR^2	F test	B	Bootstrapped 95% CI	β
Single-event trauma (ASPECTS; variables at two weeks predicting functional impairment at nine weeks post-trauma)								
	Step 1: PTSS	.23	$F_{1,202} = 61.0, p < 0.001$	.23	$F_{1,202} = 61.0, p < 0.001$	**.04**	**(.02, .06)**	.30
	Step 2: Persistent dissociation	.27	$F_{2,201} = 38.2, p < 0.001$	.04	$F_{1,201} = 12.0, p < 0.001$	**.18**	**(.08, .28)**	.27

Note. B and β are regression coefficients. 95% bootstrapped regression coefficients highlighted in bold did not cross zero.

Appendix Q – Empirical Study Supplementary Figures 1-7

Boxplots indicate the interquartile range, median, and maximum and minimum scores for the data. The mean of the data is indicated by the black square. Raw data is also displayed – please note that a degree of 'jitter' has been applied to make inspection of the data easier for the reader.
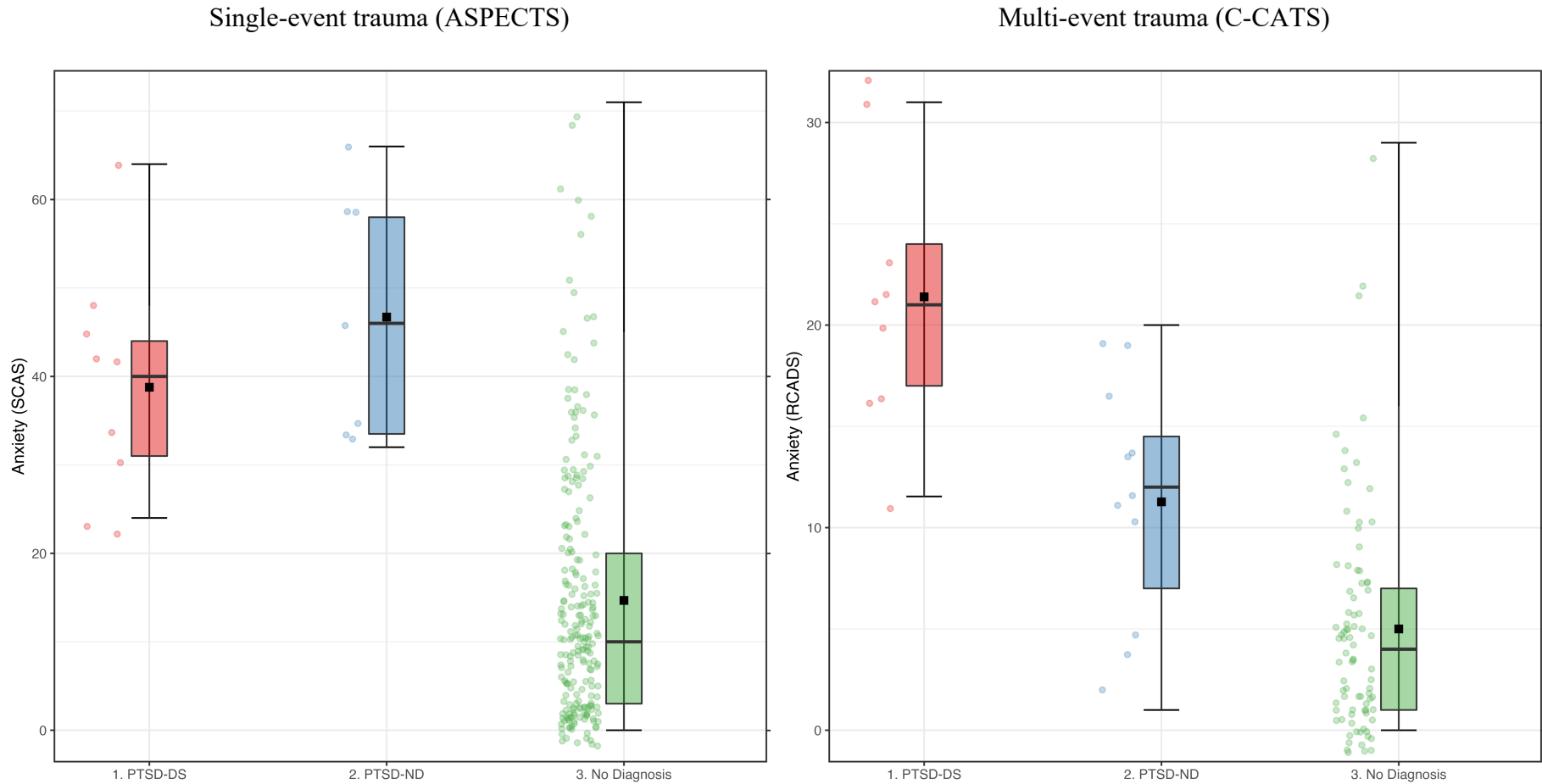
Empirical Study Supplementary Figure 1

Raincloud plot of PTSS score by diagnostic group following single-event trauma [ASPECTS; Child PTSD Symptom Scale (CPSS)] and multi-event trauma [C-CATS; Child and Adolescent Trauma Screen (CATS)].
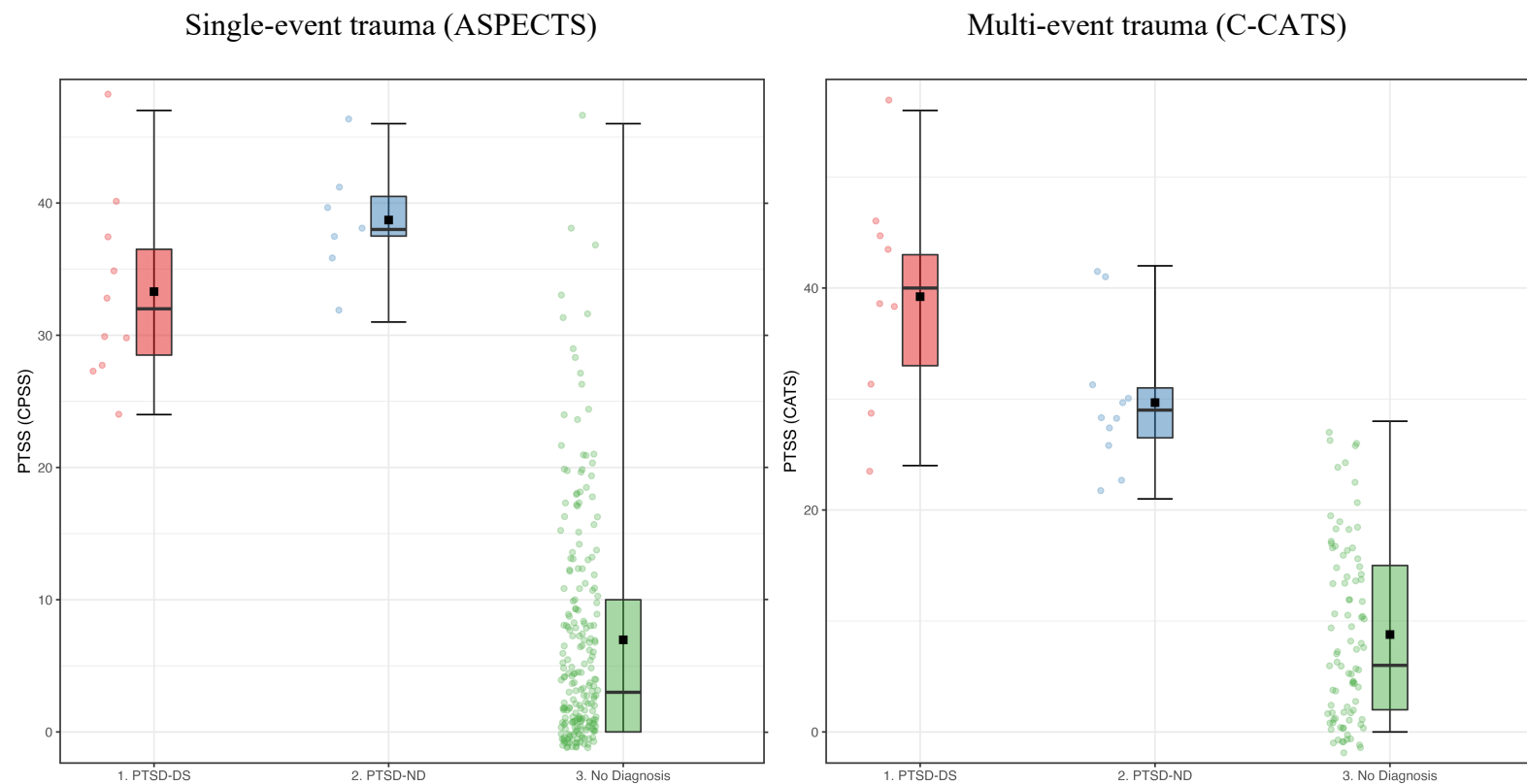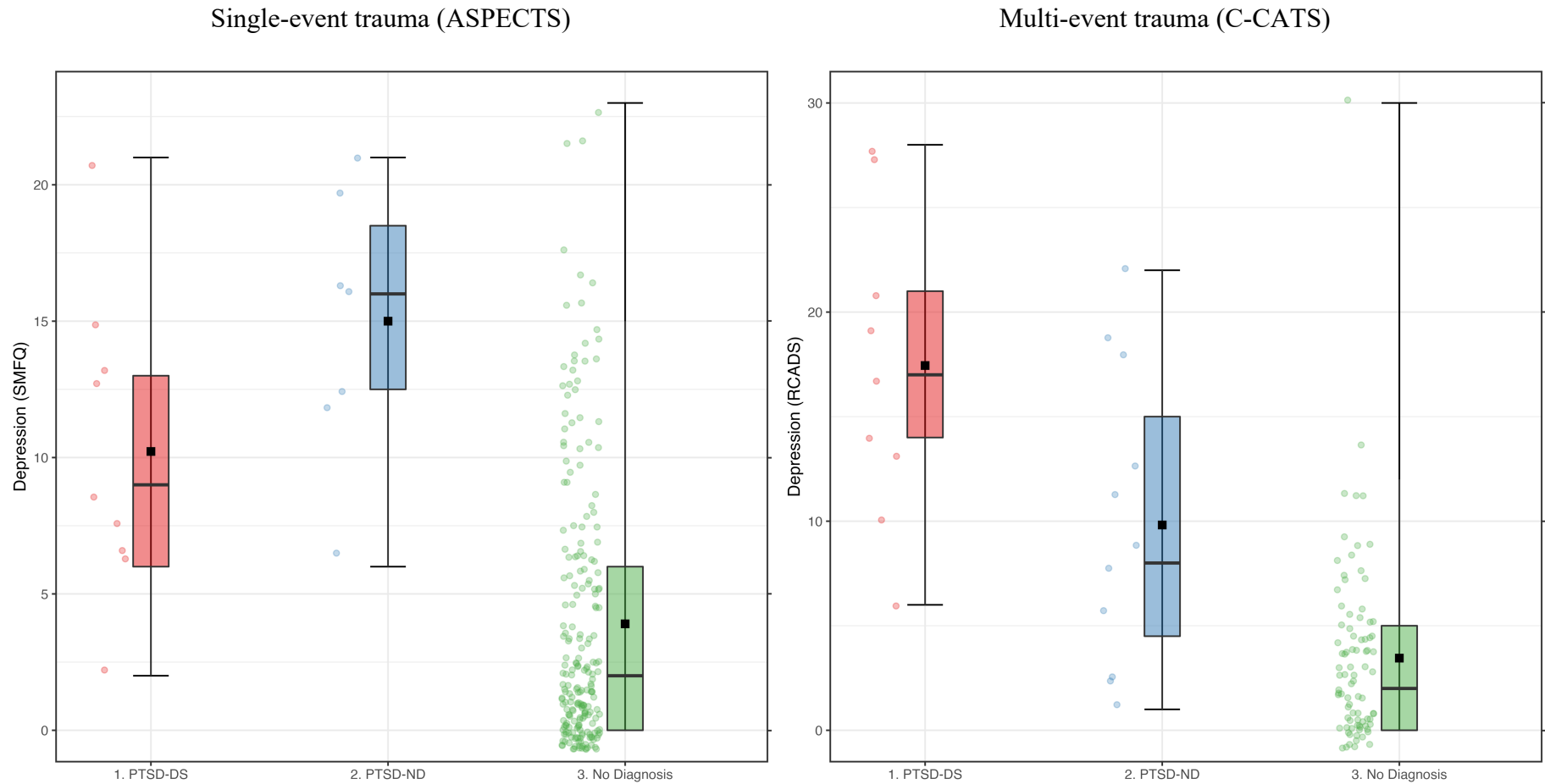
Empirical Study Supplementary Figure 2

Raincloud plot of anxiety score by diagnostic group following single-event trauma [ASPECTS; Spence Child's Anxiety Scale (SCAS)] and

multi-event trauma [C-CATS; Revised Child Anxiety and Depression Scale (RCADS)].
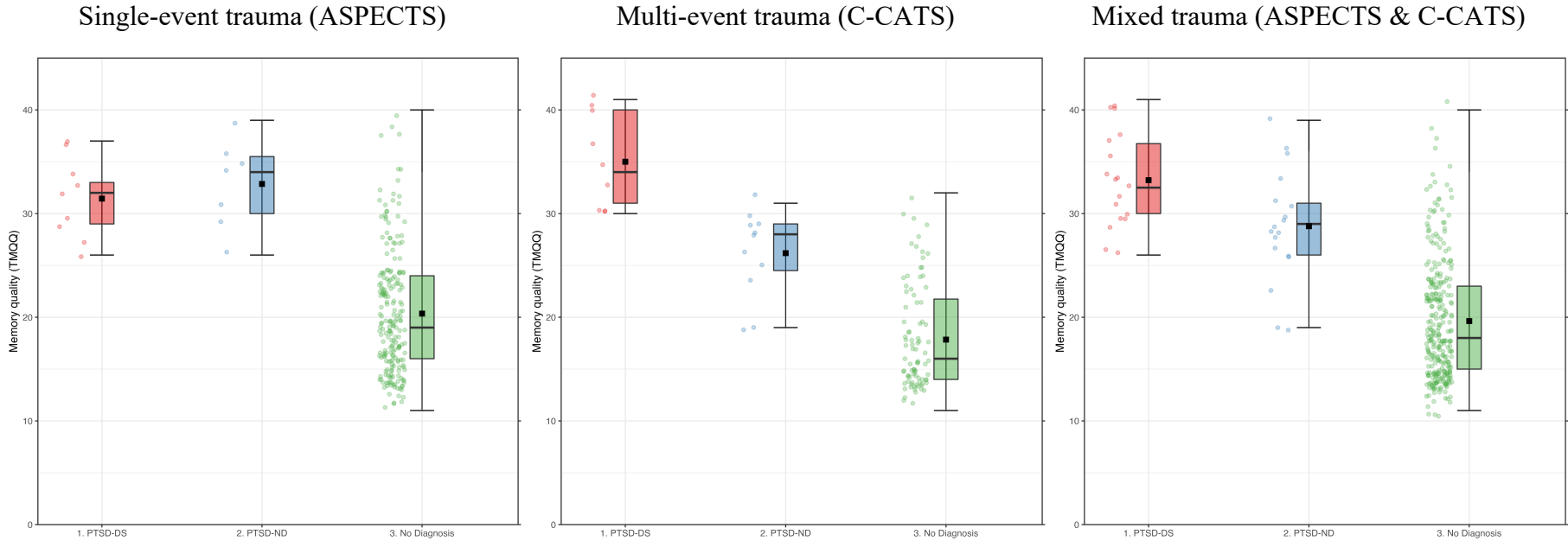
Empirical Study Supplementary Figure 3

Raincloud plot of depression score by diagnostic group following single-event trauma (ASPECTS; Short Mood and Feelings Questionnaire)

and multi-event trauma [C-CATS; Revised Child Anxiety and Depression Scale (RCADS)].
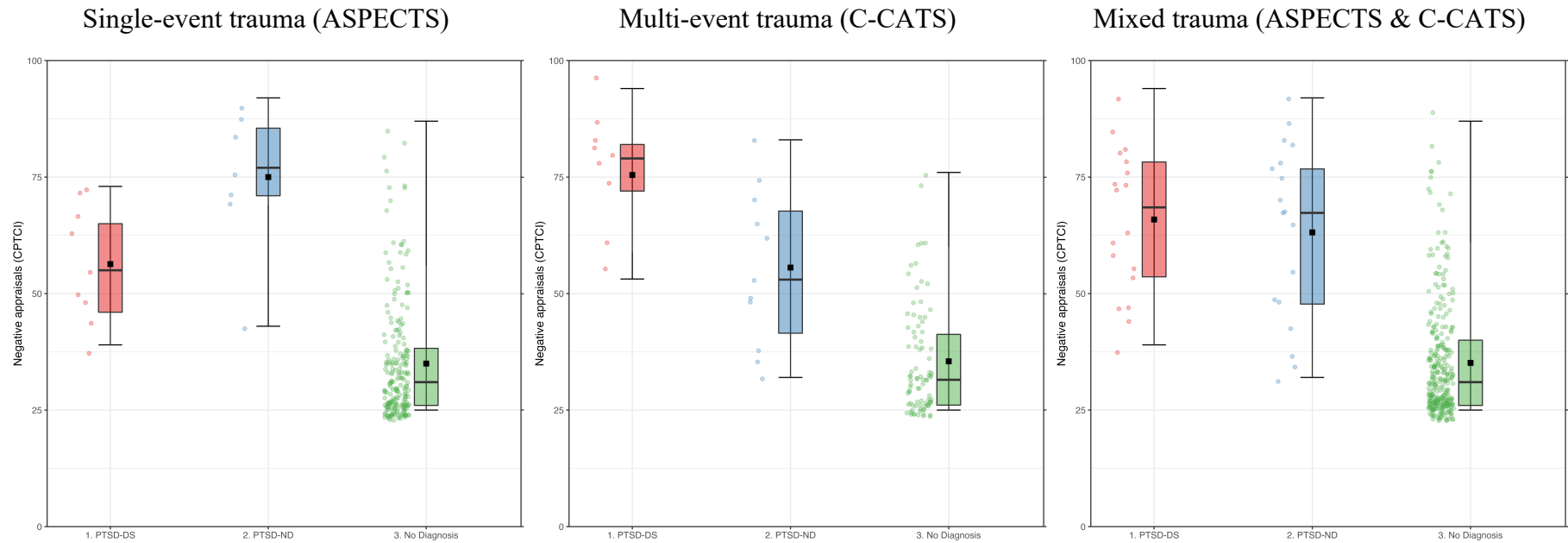
Empirical Study Supplementary Figure 4

Raincloud plot of memory quality score by diagnostic group following single-event trauma (ASPECTS). multi-event trauma (C-CATS), and mixed trauma (ASPECTS & C-CATS), all using the Trauma Memory Quality Questionnaire (TMQQ).

Empirical Study Supplementary Figure 5

Raincloud plot of negative appraisals score by diagnostic group following single-event trauma (ASPECTS), multi-event trauma (C-CATS),

and mixed trauma (ASPECTS & C-CATS), all using the Child Post-Traumatic Cognitions Inventory (*CPTCI).*

Empirical Study Supplementary Figure 6
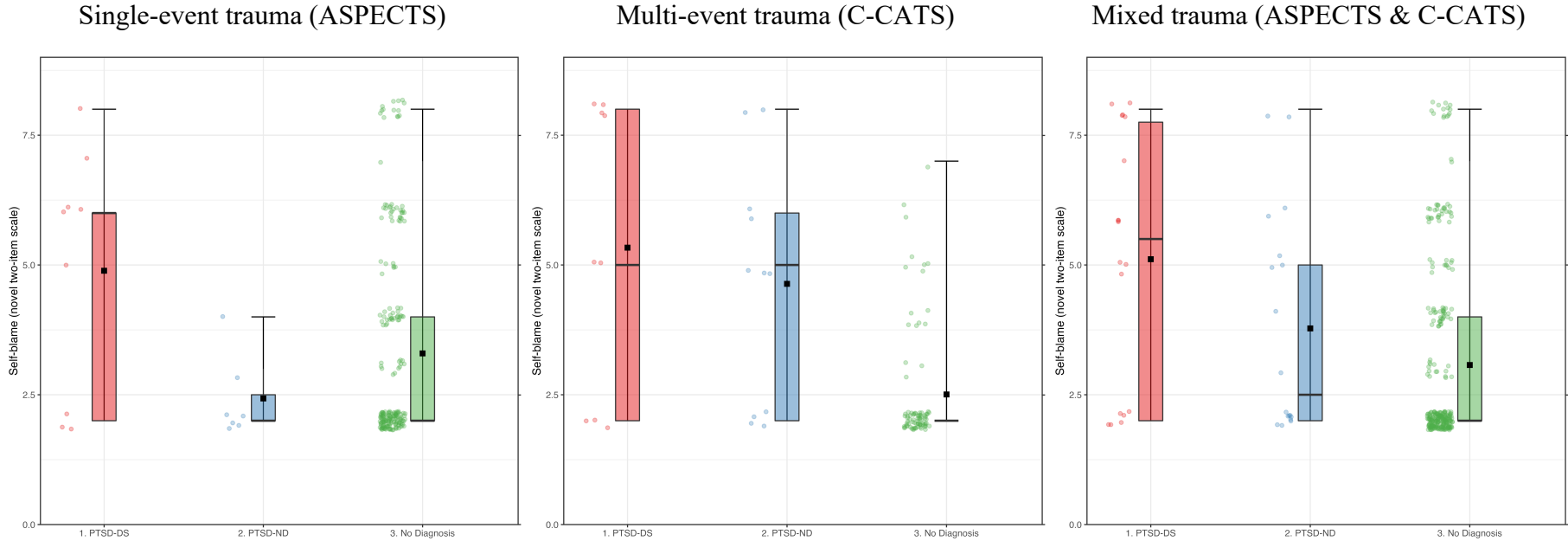
Raincloud plot of self-blame score by diagnostic group following single-event trauma (ASPECTS), multi-event trauma (C-CATS), and mixed trauma (ASPECTS & C-CATS), all using the self-blame items.
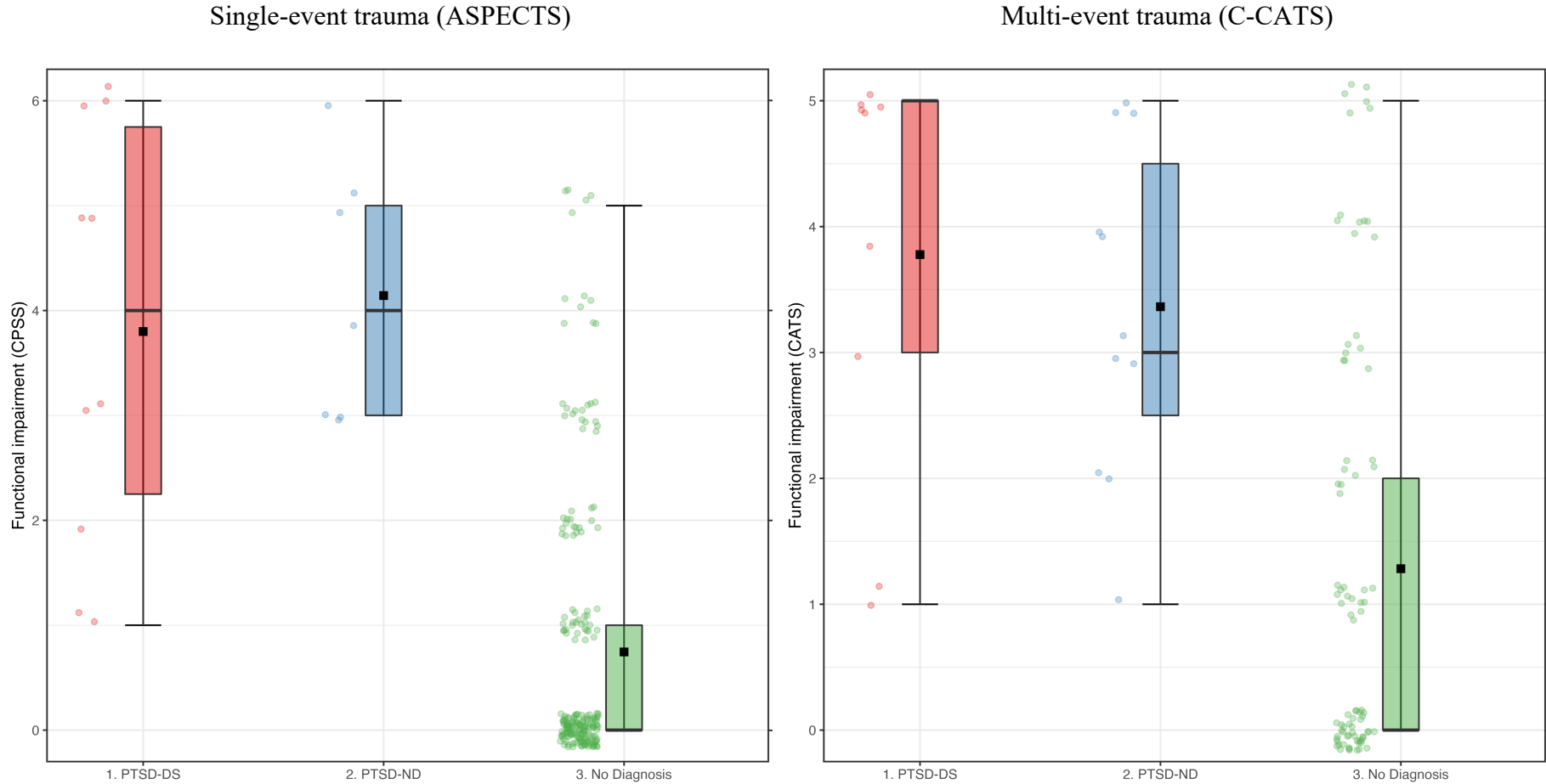
Empirical Study Supplementary Figure 7

Raincloud plot of functional impairment score by diagnostic group following single-event trauma [ASPECTS; Child PTSD Symptom Scale (CPSS)] and multi-event trauma [C-CATS; Child and Adolescent Trauma Screen (CATS)].

Appendix R – Empirical Study Supplementary Table 11

Demographic, trauma, psychopathology, post-trauma cognitive processing, and functional impairment factors by diagnostic group [based on CPTSDI for single-event trauma study (ASPECTS) only]

	Test of Significant Difference	PTSD-DS (*n* = 9)		PTSD-ND (*n* = 13)		No diagnosis (*n* = 204)	
		M	*SD*	*M*	*SD*	*M*	*SD*
Demographic factors							
Age	$H(2) = 3.23, p = 0.199$	15.2	1.7	15.4	2.2	14.0	3.0
Ethnic minority, *n* (%)	$\chi^2(2) = 0.66, p = 0.720$	0	(0.0%)	1	(7.7%)	13	(6.4%)
Female Sex, *n* (%)	$\chi^2(2) = 0.118, p = 0.943$	4	(44.4%)	5	(38.5%)	988	(43.1%)
Trauma type							
Assault (non-sexual), *n* (%)	$\chi^2(2) = 27.1, p < 0.001$	4	(44.4%)[a]	8	(61.5%)[b]	25	(12.3%)[c]
Psychopathology							
PTSS	$H(2) = 52.1, p < 0.001$	31.3[a]	10.3	33.2[a]	10.6	6.6[b]	8.2
Anxiety	$H(2) = 38.4, p < 0.001$	37.9[a]	13.7	43.1[a]	15.3	13.9[b]	14.1
Depression	$H(2) = 41.6, p < 0.001$	13.9[a]	3.8	13.1[a]	6.3	3.5[b]	4.5
Post-trauma cognitive processing							
Memory quality	$H(2) = 36.7, p < 0.001$	30.3[a]	6.7	31.3[a]	5.1	20.1[b]	5.7
Negative appraisals	$H(2) = 42.6, p < 0.001$	62.4[a]	11.9	65.3[a]	18.5	34.2[b]	11.9
Self-blame	$H(2) = 3.3, p = 0.193$	4.4	2.6	3.6	1.7	3.3	1.9
Functional impairment							
	$H(2) = 41.8, p < 0.001$	3.4[a]	1.7	3.2[a]	1.9	0.7[b]	1.3

Note. Superscript letters represent significant between group differences. ANOVA = one-way analysis of variance; PTSD = non-dissociative Post-Traumatic Stress Disorder; PTSD-DS = Post-Traumatic Stress Disorder Dissociative Subtype; PTSS = post-traumatic stress symptoms; *M* = mean; *SD* = standard deviation

Appendix S – Systematic Review PRISMA Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Manuscript title
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Inclusion and Exclusion Criteria
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Search Strategy
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Search Strategy
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Search Strategy & Data Extraction, Coding and Synthesis
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Data Extraction, Coding and Synthesis
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Data Extraction, Coding and Synthesis
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Data Extraction, Coding and Synthesis
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Quality Assessment and Risk of Bias
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Meta-Analytic Method
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Data Extraction, Coding and Synthesis
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Data Extraction, Coding and Synthesis , & Meta-Analytic

Section and Topic	Item #	Checklist item	Location where item is reported
			Method
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	N/A
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Meta-Analytic Method
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Meta-Analytic Method
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Meta-Analytic Method
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Meta-Analytic Method
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Meta-Analytic Method
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Results & Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Risk of Bias Assessment & Supplementary information
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Figure 2
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Risk of Bias Assessment, Sensitivity Analysis, & Supplementary information
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Results, Tables 2-4, Figure 2, & Supplementary information
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Results, Tables 2-4, & Supplementary information

Section and Topic	Item #	Checklist item	Location where item is reported
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Sensitivity Analysis
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Publication Bias
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Results, Tables 2-4, Supplementary Information
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion
	23b	Discuss any limitations of the evidence included in the review.	Discussion
	23c	Discuss any limitations of the review processes used.	Limitations
	23d	Discuss implications of the results for practice, policy, and future research.	Clinical Implications and Suggestions for Future Research
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Method
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Method
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Prospero protocol
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding statement
Competing interests	26	Declare any competing interests of review authors.	Conflict of interest
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Table 1, analytic code not publicly available

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix T – ASPECTS Research Ethics Committee Approval Letter

NHS

National Research Ethics Service

Cambridgeshire 1 Research Ethics Committee

Victoria House
Capital Park
Fulbourn
Cambridge
CB21 5XB

Telephone: 01223 597653
Facsimile: 01223 597645

29 April 2010

Dr Richard Meiser-Stedman
MRC Clinician Scientist Fellow
MRC Cognition & Brain Sciences Unit
15 Chaucer Road
Cambridge CB2 7EF

Dear Dr Meiser-Stedman

Study Title:	**Cognitive behavioural therapy (CBT) as an early intervention for post-traumatic stress disorder (PTSD) in youth: preliminary efficacy and mechanisms of action**
REC reference number:	**10/H0304/11**
Protocol number:	**Version 2**

Thank you for your letter of 19 April 2010, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

The Committee has not yet been notified of the outcome of any site-specific assessment (SSA) for the non-NHS research site(s) taking part in this study. The favourable opinion does not therefore apply to any non-NHS site at present. I will write to you again as soon as one Research Ethics Committee has notified the outcome of a SSA. In the meantime no study procedures should be initiated at non-NHS sites.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

This Research Ethics Committee is an advisory committee to the East of England Strategic Health Authority
The National Research Ethics Service (NRES) represents the NRES Directorate within
the National Patient Safety Agency and Research Ethics Committees in England

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk. *Where the only involvement of the NHS organisation is as a Participant Identification Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.*

Sponsors are not required to notify the Committee of approvals from host organisations.

Other conditions specified by the REC

- The following statement on the Information Sheets for the 8-10 year old children appears to have a superfluous 'to complete': *"We would like you and a parent to complete to speak to us on the telephone or face-to-face."* You are asked to remove this.
- The Parent Information Sheets now include the details: *"We will record our sessions using a video or audio recording device".* You need to also include information that the recording will be stored in a secure location and destroyed within a set period of time once the information has been transcribed. The set period of time will need to be detailed.
- The Information for Children (8-10) about the Study (control, trauma-exposed) is missing the version number and date, you are asked to include this detail.

Final versions of documents should be provided to the Committee for information; please be advised that dates and version numbers of these documents will need to be revised.

Authority is delegated to the Co-ordinator to ensure compliance with the above request.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter from Dr Richard Meiser-Stedman, MRC Clinician Scientist Fellow		29 January 2010
REC application	Code: 38523/94073/1/925	29 January 2010
Investigator CV - Dr Richard Meiser-Stedman		29 January 2010
Participant Consent Form: Youg person (trial)	Version 1	29 January 2010
Letter of invitation to participant - for school parents	Version 1	29 January 2010
GP/Consultant Information Sheets - GP letter	Version 1	29 January 2010
Participant Consent Form: Young person (control)	Version 1	29 January 2010
Letter from Sponsor, email from Tanya Izzard		13 January 2010
MRC Fellowship award to Mr R A Meiser-Stedman		
Peer Review Assessment Form - Referee 1		
Peer Review Assessment Form - Referee 2		
Peer Review Assessment Form - Referee 3		

Peer Review Assessment Form - Referee 4		
Letter from Statistician - letter from Dr Tim Croudace		19 November 2008
Questionnaire: CPSS		
Questionnaire: RIES-C		
Questionnaire: SPENCE Children's Anxiety Scale		1994
Questionnaire: Mood and Feelings		
Trial flow diagram		27 January 2010
Questionnaire cover sheet		
Questionnaire: CPTCI		2003
Questionnaire: MMQ		2003
Questionnaire: Multidimensional Scale of Perceived Social Support		1988
Questionnaire: Thoughts during the frightening event		
Questionnaire: Autobiographical Memory Questionnaire		
Protocol	Version 1	29 January 2010
Questionnaire: The centrality of events scale		
Questionnaire: Self-Control Scale		
Questionnaire: Working Alliance Inventory		1989
GP Postcard 'Exposure to a terrifying event?'		
Protocol	Version 2	15 April 2010
Participant Information Sheet: Information for Parents about the study (screening)	v2	15 April 2010
Participant Information Sheet: Information for Parents about the study (trial)	v2	15 April 2010
Participant Information Sheet: Information for Parents about the study (control, non-trauma)	v2	15 April 2010
Participant Information Sheet: Information for Parents about the study (control, trauma-exposed)	v2	15 April 2010
Participant Information Sheet: Information for Young People (8-10) about the study (screening)	v2	15 April 2010
Evidence of insurance or indemnity - MRC Statement of Indemnity	Version 1	October 2008
Questionnaire: Spence Children's Anxiety Scale	1994 - Susan H. Spence	1994
Questionnaire: Short Mood and Feelings Questionnaire - Child Version		
Response to Request for Further Information from Dr Richard Meiser-Stedman		19 April 2010
Participant Information Sheet: Information for Children (8-10) about the Study (trial)	v2	15 April 2010
Participant Information Sheet: Information for Children (8-10) about the Study (control, non-trauma)	v2	15 April 2010
Participant Information Sheet: Information for Children (8-10) about the Study (control, trauma-exposed)	v2	15 April 2010
Participant Information Sheet: Information for Young People (11-15) about the Study (screening)	v2	15 April 2010
Participant Information Sheet: Information for Children (11-15) about the Study (trial)	v2	15 April 2010
Participant Information Sheet: Information for Young People (11-15) about the Study (controls, non-trauma)	v2	15 April 2010
Participant Information Sheet: Information for Young People (11-15) about the Study (controls, trauma-exposed)	v2	15 April 2010
Participant Information Sheet: Information for Young People	v2	15 April 2010

(16-17) about the Study (screening)		
Participant Information Sheet: Information for Children (16-17) about the Study (trial)	v2	15 April 2010
Participant Information Sheet: Information for Young People (16-17) about the Study (controls, non-trauma)	v2	15 April 2010
Participant Information Sheet: Information for Young People (16-17) about the Study (controls, trauma exposed)	v2	15 April 2010
Participant Consent Form: Parent Consent Form - screening	v2	15 April 2010
Participant Consent Form: Parent Consent Form - trial	v2	15 April 2010
Participant Consent Form: Parent Consent Form - control	v2	15 April 2010
Participant Consent Form: Young person consent form - screening	v2	15 April 2010
Letter of invitation to participant - Initial contact letter from hospital	v2	15 April 2010
Advertisement - 'Would you like to help with a research study?'	v1	15 April 2010
A76 and A77 of Application Form detailing indemnity arrangements		01 February 2010
D1 Declaration by the Sponsor's representative		19 April 2010

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk

10/H0304/11	**Please quote this number on all correspondence**

Yours sincerely

Dr Daryl Rees
Chair

Email: susan.davies@eoe.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

Copy to: Mr Brien Patel
                     R & D Depart
                     Box 277 – Addenbrooke's Hospital

                     Professor William Marslen-Wilson
                     Director of Cognition and Brain Sciences Unit
                     MRC Cognition & Brain Sciences Unit
                     15 Chaucer Road
                     Cambridge CB2 7EF

Appendix U – C-CATS Research Ethics Committee Approval Letters

NHS
Health Research Authority

Social Care REC

Ground Floor
Skipton House
80 London Road
London
SE1 6LH

Tel: 0207 972 2568

> **Please note: This is the favourable opinion of the REC only and does not allow the amendment to be implemented at NHS sites in England until the outcome of the HRA assessment has been confirmed.**

13 February 2017

Dr Rachel Hiller
Department of Psychology
University of Bath
Claverton Down
BA27AY

Dear Dr Hiller

Study title:	**Identifying the trauma-related profiles of children in foster care**
REC reference:	**16/IEC08/0025**
Amendment number:	**4**
Amendment date:	**21 December 2016**
IRAS project ID:	**193130**

The above amendment was reviewed by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Notice of Substantial Amendment (non-CTIMP)	4	21 December 2016

| Participant consent form [Social Worker] | 4 | 22 January 2017 |
| Research protocol or project proposal | 5 | 21 January 2017 |

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our Research Ethics Committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

| 16/IEC08/0025: | Please quote this number on all correspondence |

Yours sincerely

pp Barbara Crichton

Mr Craig Moss
Chair

E-mail: nrescommittee.social-care@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Laura Armstrong, Avon and Whiltshire Trust R&D*
                        Prof Jonathan Knight

Social Care REC

Attendance at Sub-Committee of the REC meeting in correspondence

Committee Members:

Name	Profession	Present	Notes
Mr Craig Moss - Chair	Research Director	Yes	
Dr Lindsey Pike	Senior Research and Development Officer	Yes	

Also in attendance:

Name	Position (or reason for attending)
Mrs Barbara Cuddon	REC Manager

UNIVERSITY OF
BATH

Professor Jonathan Knight BSc, MSc, PhD
Pro-Vice-Chancellor Research

Vice-Chancellor's Office
Bath BA2 7AY
Tel: 01225 386141
Email: j.c.knight@bath.ac.uk

Rachel hiller
Department of Psychology

21 June 2017

Dear Rachel

Re: minor amendments to REC 193130: Identifying the trauma-related profiles of children in foster care

This is to confirm the sponsor of this study, the University of Bath, is satisfied that adding a second local authority recruitment site to this project is a minor amendment approval of which you will be seeking from the appropriate NRES Committee.

Yours sincerely

Professor Jonathan Knight
Pro-Vice-Chancellor Research

Appendix V - Cover Letter for the Submission of the Systematic Review Manuscript for Consideration by Psychological Medicine

University of East Anglia Clinical Psychology Doctorate Programme

Faculty of Medicine and Health Sciences

University of East Anglia

Norwich Research Park

Norwich

NR4 7TJ

Psychological Medicine

Cover letter for submission of manuscript for consideration by Psychological Medicine

Dear Sir or Madam,

We would like to submit our manuscript entitled "Prevalence of the Dissociative Subtype of Post-Traumatic Stress Disorder: A Systematic Review and Meta-Analysis" for your consideration. The protocol for this review was pre-registered on PROSPERO (reference: CRD42021210902) prior to any formal review of searches. This study is the first to meta-analyse the prevalence of the Dissociative Subtype of Post-Traumatic Stress Disorder in both children and adults, following its introduction in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders. This review raises important issues around the conceptualisation and utility of this subtype.

Please find manuscript and PRISMA 2020 checklist included in this submission.

We look forward to receiving your comments and feedback on this submission in due course.

Yours sincerely,

William White
University of East Anglia