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The impact of childhood maltreatment on the severity of childhood-related posttraumatic stress disorder in adults[☆]

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ABSTRACT

Background: Childhood maltreatment is relatively common and is related to a range of negative consequences, such as Posttraumatic Stress Disorder (PTSD). There are indications that various maltreatment types are related to PTSD severity, although not all types, such as emotional abuse, meet the PTSD Criterion-A.

Objective: The aim of the present study was to examine the relationship between 5 types of childhood maltreatment (i.e., sexual, physical, and emotional abuse, and physical and emotional neglect) and the severity of adult PTSD and PTSD symptoms.

Participants and setting: Adult participants ($N = 147$) with Childhood-related PTSD (Ch-PTSD) recruited from clinical sites completed the Childhood Trauma Questionnaire-short form (CTQ-sf) and 2 PTSD measures: The Clinician Administered PTSD Scale for DSM-5 (CAPS-5) and the PTSD Checklist for DSM-5 (PCL-5).

Methods: Childhood maltreatment predictors and 2 covariates, age and gender, were analysed in multivariate multilevel models as participants were nested within sites. A model selection procedure, in which all combinations of predictors were examined, was used to select a final set of predictors.

Results: The results indicated that emotional abuse was the only trauma type that was significantly related to severity of PTSD and to the severity of specific PTSD symptom clusters (r between 0.130 and 0.338). The final models explained between 6.5% and 16.7% of the variance in PTSD severity.

Conclusions: The findings suggest that emotional abuse plays a more important role in Ch-PTSD than hitherto assumed, and that treatment should not neglect processing of childhood emotional abuse.

1. Introduction

Childhood maltreatment, including various forms of abuse and neglect, is relatively common. Meta-analyses estimated the global

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prevalence of physical abuse at 17.7% (Stoltenborgh et al., 2013), sexual abuse at 11.8% (Stoltenborgh et al., 2011), and emotional abuse at 26.7% (Stoltenborgh et al., 2012). In addition, the global prevalence of physical and emotional neglect is estimated at 16.3% and 18.4%, respectively (Stoltenborgh et al., 2013). These numbers are alarming, as adverse childhood events have been associated with poor mental health (Witt et al., 2017), and an increased risk of various health-related risk behaviours, physical diseases, and psychiatric disorders (Oral et al., 2016).

In addition to these more general negative consequences, childhood maltreatment can also lead to Posttraumatic Stress Disorder (PTSD), which consists of four symptom clusters: intrusive memories, avoidance, negative changes in thinking and mood, and hyperarousal (American Psychiatric Association, 2013). PTSD following childhood trauma is also referred to as Childhood-related PTSD (Ch-PTSD). The diagnosis of PTSD depends, among other things, on whether traumatic experiences meet the Criterion-A of PTSD in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), which states that exposure to actual or threatened death, injury, or sexual violence is a necessary precondition for a diagnosis (APA, 2013). Childhood maltreatment types such as sexual and physical abuse satisfy this criterion, while other experiences such as emotional abuse and neglect do not. It has been suggested however, that childhood maltreatment types such as emotional abuse and neglect are also related to PTSD symptoms (Dorahy et al., 2009; Mol et al., 2005). This is relevant for patients with Ch-PTSD (and their treatment) who have often been exposed to childhood experiences that both do (e.g., sexual abuse) and do not (e.g., emotional abuse) fit the current DSM-5 Criterion-A of PTSD.

Studies that examined the relationships between Criterion-A traumatic events and PTSD severity have indeed found that childhood sexual and physical abuse are related to PTSD severity (Briere et al., 2008; Cogle et al., 2010; Kim et al., 2013; Plotzker et al., 2007; Romero et al., 2009). Other studies suggest that non-Criterion-A experiences may also contribute to PTSD, but have methodological limitations that preclude definitive conclusions. For instance, in studies which showed that emotional abuse (English et al., 2015) and emotional neglect (Pederson & Wilson, 2009) were associated with PTSD, other maltreatment types were not assessed and could not be ruled out as alternative explanations. Other studies have analysed specific combinations of abuse and neglect types. One study indicated that emotional and physical abuse predicted PTSD severity (Evren et al., 2016), while others found that emotional abuse and sexual abuse, but not physical abuse, predicted PTSD severity. Findings even suggest that emotional abuse is in fact the strongest predictor of PTSD (Grassi-Oliveira & Stein, 2008), as shown in a stepwise model building procedure. In addition, it has also been shown that after controlling for Criterion-A traumas, emotional abuse and neglect significantly predicted PTSD severity (Spertus et al., 2003), although physical neglect was not included and could not be ruled out as an alternative explanation. Thus, in order to better disentangle the unique relationships between various childhood maltreatment types and PTSD severity, studies need to test all maltreatment types simultaneously in a single model.

In studies that tested such a single statistical model in adolescents and youth, only emotional abuse appeared to be related to PTSD and PTSD symptom cluster severity, and other psychiatric symptoms (Cecil et al., 2017; Sullivan et al., 2006). Moreover, in a group of children and adolescents receiving trauma-focused treatment, only emotional abuse and neglect, and no other abuse and neglect types, were related to PTSD severity (Hoeboer et al., 2020). Contrary to these findings, one meta-analysis suggested that Criterion-A traumas were more strongly related to PTSD severity than other aversive events (Larsen & Pacella, 2016). These mixed findings indicate that several types of childhood abuse and neglect may contribute to the severity of PTSD, even if they do not formally meet the present DSM-5 Criterion-A.

However, several issues remain unclear. Although two previous studies have tested all common childhood abuse and neglect types simultaneously, to our knowledge this has not been examined in adult patients with a primary Ch-PTSD diagnosis (i.e., adult PTSD patients who experienced a Criterion-A trauma in childhood), limiting the ability to generalize the findings described above to this patient group. Important to mention is that although this question is relevant for patients with Ch-PTSD, it is also relevant to study in other groups, such as patients with PTSD from adult experiences, as childhood experiences will not always lead to a PTSD diagnosis. In addition, because previous studies were all conducted with adolescents and children, it is unknown what the longer-term effects of the different forms of childhood maltreatment are on PTSD symptoms in adulthood.

Against this background, the first aim of the present study was to examine if three self-reported abuse types (i.e., sexual, physical, and emotional abuse) and two self-reported neglect types (i.e., physical and emotional neglect) were associated with the severity of PTSD and separate PTSD symptom clusters in adult patients with Ch-PTSD (i.e., patients who experienced a trauma that meets the DSM-5 Criterion-A before the age of 16). All five abuse and neglect types were tested simultaneously in a single model. Additionally, we controlled for age and gender. First, men experience more severe PTSD symptoms after non-Criterion-A events compared to women (Van den Berg et al., 2017), while girls are often exposed to different trauma types than boys (Petry & Steinberg, 2005; Sullivan et al., 2006), and we expected our sample to consist of a large proportion of females. Second, age is related to trauma exposure (Sullivan et al., 2006) and both a person's ways of coping with traumatic experiences and the course of his or her symptoms might be dependent on age. The second aim of this study was to explore which of the abuse and neglect types were essential in predicting PTSD and PTSD symptom cluster severity. Lastly, clinician rated as well as self-report PTSD severity measures were included to examine if the findings prove robust across these types of assessment.

2. Method

The present study is part of a larger multisite Randomized Controlled Trial (RCT): the IREM-Freq trial. The analysis and methods of the present study were preregistered (osf.io/e2tq5).

2.1. Participants

All participants ($N = 147$), of which 116 (78.9%) were female and 31 (21.1%) were male, were recruited from 10 different mental health sites in three countries: The Netherlands ($n = 67$), Australia ($n = 36$), and Germany ($n = 44$). The mean age of the sample was 38.97 ($SD = 12.58$, range 18–66). The most prevalent comorbid disorders in the sample were anxiety disorders ($n = 138$), followed by mood disorders ($n = 57$), eating disorders ($n = 26$), and Obsessive-Compulsive and related disorders ($n = 25$).

Participants were included in the RCT if they: 1) were between 18 and 70 years old; 2) had a primary diagnosis of PTSD as assessed with the Structured Clinical Interview for DSM-5 (First et al., 2016) and had experienced their index trauma (i.e., worst traumatic event) before the age of 16; 3) had a PTSD duration longer than 3 months; and 4) had sufficient language proficiency to complete the RCT's study procedures. Participants were excluded if they: 1) had experienced a trauma less than 6 months ago; 2) had a moderate or severe substance use disorder (unless they remained abstinent for 6 weeks); 3) had a current psychotic disorder; 4) had a bipolar I disorder; 5) displayed acute suicide risk; 6) had an IQ below 80; 7) had neurological problems such as dementia; 8) were scheduled to start PTSD treatment outside the RCT and/or had received PTSD focused treatment in the past three months, and/or received changes in medication in past last three weeks; or 9) used benzodiazepines (unless patients discontinued their use and were abstinent for at least three weeks).

2.2. Materials

2.2.1. Clinician-rated PTSD severity

The clinician-rated severity of PTSD symptoms was assessed with the *Clinician Administered PTSD Scale for DSM-5* (CAPS-5; Weathers, Blake, et al., 2013). The CAPS-5 consists of 20 items, corresponding to the DSM-5 PTSD criteria, that focus on symptoms experienced in the past month. Each symptom receives a severity score (0–4), based on an intensity and a frequency score. The total severity score is calculated by summing all symptom severity scores, with higher scores indicating greater symptom severity. The total severity scale of the CAPS-5 has a good internal consistency and validity (Boeschoten et al., 2018; Weathers et al., 2017). In our sample, the internal consistency of the total severity scale was $\alpha = 0.81$.

2.2.2. Self-reported PTSD severity

The self-reported severity of PTSD symptoms during the past week was assessed with the *PTSD Checklist for DSM-5* (PCL-5; Weathers, Litz, et al., 2013). The PCL-5 consists of 20 items, corresponding to the DSM-5 PTSD criteria, which are scored on a 5-point Likert scale (ranging from 0 = *Not at all* to 4 = *Extremely*). The questionnaire, as used in the IREM-Freq trial, consists of two subscales. The first subscale focuses on complaints with respect to the index trauma (i.e., worst experienced traumatic event before the age of 16) and the second subscale focuses on all other traumas excluding the index trauma. The traumas addressed by this second subscale thus potentially include non-Criterion-A events such as emotional abuse. The PCL-5 shows strong internal consistency and good validity (Blevins et al., 2015; Bovin et al., 2016). In our sample, internal consistency was $\alpha = 0.93$ for the total score related to the index trauma and $\alpha = 0.96$ for the total score related to all other traumas.

2.2.3. Trauma exposure

Exposure to negative childhood experiences was assessed with the *Childhood-Trauma Questionnaire-short form* (CTQ-sf; Bernstein et al., 2003), a self-report questionnaire consisting of 28 items that are rated on a 5-point Likert scale (ranging from 1 = *Never true* to 5 = *Very often true*). The CTQ-sf consists of five subscales: sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect. The validity and reliability of the CTQ-sf is satisfactory (Karos et al., 2014; Thombs et al., 2009). Based on the scores on each CTQ subscale, cut-off scores were used to categorize participants into four categories of trauma exposure severity for each separate subscale: none, low, moderate, and severe (Bernstein & Fink, 1998). Internal consistency was $\alpha = 0.84$ for emotional abuse, $\alpha = 0.88$ for physical abuse, and $\alpha = 0.89$ for sexual abuse. The internal consistency for emotional neglect was $\alpha = 0.98$ and for physical neglect $\alpha = 0.67$.

2.3. Procedure

The present study analysed the baseline RCT data available per 6 July 2020. Therefore, only a description of the study procedures up to and including the baseline assessment will be given. After participants completed the screening and intake procedure, fulfilment of the eligibility criteria was checked by the central research assistant. Next, eligible participants who signed informed consent were randomized into one of the four study conditions by an independent researcher located at the University of Amsterdam. After randomization, the baseline assessment was administered. For a more detailed description of the study procedure, see: <https://www.trialregister.nl/trial/6965>. The project received ethical approval in all participating countries.

All assessments were administered by trained, independent and blind research assistants, and were planned to be completed on site. However, due to Covid-19, face-to-face contact was limited from March 2020 onwards. For this reason, several assessments took place online and/or over the phone.

2.4. Analysis

The data was analysed with a multilevel linear regression analysis in R studio with the package *nlme* (Pinheiro et al., 2019).

Participants were recruited from 10 sites and therefore the data had a hierarchical structure. Consequently, participants from within a site might show more similarity in responding compared to participants between different sites. That is, differences between sites (e.g., the PTSD severity scores from participants within a site might be more dependent because of certain participant characteristics, such as the nature of the traumas, the type of referrals, or cultural influences), can lead to dependence of the residuals of observations within the same site. To control for the nesting of participants within site, a 2-level multilevel linear model with participants at level 1 and sites at level 2 was fitted by adding a random intercept for site. All independent variables were entered as fixed factors and can be interpreted as regular linear regression coefficients.

First, in order to test the relationships between all CTQ subscales and PTSD severity, all five types of abuse and neglect were included as predictors in a single model in addition to age and gender. For each outcome variable (i.e., CAPS-5 severity score and the two PCL-5 subscale severity scores for index traumas and all other traumas), we ran a separate regression analysis. The items from the PCL-5 index trauma subscale were focused on PTSD complaints related to the index trauma, whereas the items from the PCL-5 other trauma subscale were related to all other traumatic experiences excluding the index trauma. In addition, we ran separate regression analyses for each of the different PTSD symptom clusters (i.e., intrusions, avoidance, negative changes in cognitions and emotions, and changes in arousal). For each predictor, standardized and unstandardized beta coefficients were reported. An alpha level of 0.05 was used as a cut-off. For each model, the effect size r was calculated for the fixed part (partial correlation) between each predictor and the outcome variable with the following formula: $r = \sqrt{\frac{t^2}{t^2 + df}}$. The marginal R^2 was calculated (i.e., variance explained by the fixed effects) to estimate the amount of variance explained by the predictors in each model. Before conducting the analyses, we tested if the model residuals fulfilled the assumptions of normality, homoscedasticity and linearity. Outliers were defined as Pearson residuals with an absolute value > 3 (Blatná, 2006) and the analyses were re-run without outliers to examine if this influenced the results. Pearson correlations between the CTQ subscales and variance inflation factor (VIF) values were used to examine multicollinearity.

Second, in order to test an optimal model of CTQ subscales, a final set of predictors was selected using multi model inference from the *MuMin* package (Bartoň, 2019). This procedure fits every possible combination of predictors and ranks them based on selected model fit indices. The two covariates were forced into each model before model selection. The final model was identified with the Bayesian Information Criterion (BIC), which is more reliable compared to R^2 as it penalizes model complexity. In case models had a BIC difference between 0 and 2 (Neath & Cavanaugh, 2012), the model with the highest loglikelihood value was selected.

Of the initial 148 participants, one participant with missing data on all five predictors (CTQ-sf subscales) was excluded, which led to a final sample size of 147 participants. In addition, for one participant the CAPS-5 scores were not available. Therefore, the analyses involving the CAPS-5 scores were conducted on 146 participants.

3. Results

The average scores on all continuous predictors and outcome variables are shown in Table 1. Table 2 shows the maltreatment exposure scores on the CTQ subscales. There was ample variation in the variables to allow for correlation. Based on the Pearson residuals and predicted values of all multilevel models, no assumptions were violated. The highest Pearson correlation (see Appendix A)

Table 1
Demographic information of the complete sample ($N = 147$).

Variable	M (SD)
Type of index trauma N (%)	
Death	7 (4.8%)
Physical	21 (14.3%)
Sexual	79 (53.7%)
All three combined	9 (6.1%)
Sexual and physical	11 (7.5%)
Physical and death	17 (11.6%)
Death and sexual	2 (1.4%)
CAPS-5 ^a	37.40 (10.95)
CAPS intrusions	10.51 (3.46)
CAPS avoidance	4.30 (1.68)
CAPS cognitions	13.64 (5.24)
CAPS arousal	8.96 (3.64)
PCL-5 index trauma	43.42 (15.82)
PCL-5 all other traumas	40.86 (17.06)
CTQ – sexual abuse	16.74 (6.30)
CTQ – physical abuse	12.35 (5.95)
CTQ – emotional abuse	17.98 (5.42)
CTQ – physical neglect	11.99 (4.30)
CTQ – emotional neglect	18.09 (5.52)

^a One participant had missing data on the CAPS (and subscales), so these means, and all analyses involving these outcomes are conducted on $n = 146$. CAPS = Clinician Administered PTSD Scale for DSM-5; PCL-5 = PTSD Checklist for DSM-5; CTQ = Childhood Trauma Questionnaire.

between the CTQ subscales was $r = 0.65$ between emotional abuse and emotional neglect. In addition, as all VIF values fell between 1.00 and 2.29, there were no indications of multicollinearity between the CTQ predictors.

3.1. The relationship between CTQ subscales and clinician-rated PTSD severity

All CTQ subscales were added as predictors in a model with the CAPS-5 total severity score as the outcome variable (see Table 3). In this model, which explained 10.9% of the variance, only emotional abuse significantly and positively predicted the CAPS-5 score. In addition, for three CAPS-5 symptom clusters (i.e., intrusions, changes in cognitions and mood, and arousal), emotional abuse was the only maltreatment type related to symptom cluster severity. In contrast, none of the covariates and CTQ subscales was predictive of the CAPS-5 avoidance cluster.

Emotional abuse was the only maltreatment type selected in the final models of the CAPS-5 outcomes and was also positively related to PTSD severity. However, for avoidance, none of the predictors was selected in the final model. The removal of outliers ($n = 2$) did not influence the results.

3.2. The relationship between CTQ subscales and self-reported PTSD severity

For self-reported PTSD severity, all predictors were tested for each PCL-5 subscale separately (see Table 4). For the PCL-5 index trauma subscale, emotional abuse was the only significant predictor. For the PCL-5 subscale for all other traumas, none of the CTQ subscales significantly predicted PTSD severity. This was in contrast to age, which was positively related to the total score. Both models explained around 12% of variance.

In the final models, only emotional abuse was selected. For the PCL-5 subscale for all other traumas, both emotional abuse and age were positively related to the PCL-5 total score. These models explained 16.7% and 18.7% of variance respectively. No outliers were detected.

4. Discussion

The aim of the present study was to examine the relationships between childhood maltreatment types and PTSD severity. First, the findings indicated that for adults who had experienced Criterion-A childhood abuse types, such as sexual and physical abuse, higher levels of emotional abuse were associated with increased PTSD severity in adulthood both overall and - with the exception of avoidance - at the symptom-cluster level. Other types of childhood maltreatment were not associated with increased PTSD severity. Therefore, these findings extend on the results of previous studies focusing on adolescents and children (Cecil et al., 2017; Hoeboer et al., 2020; Sullivan et al., 2006), by indicating that the influence of emotional abuse in addition to Criterion-A traumas on PTSD is longer term and continues into adulthood.

In contrast with Sullivan et al. (2006), none of the maltreatment types was related to PTSD avoidance symptoms. It is unclear what can explain this finding, but it could be caused as avoidance might bias reporting or interviews. The models in the study of Sullivan et al. (2006) explained a higher percentage of variance ($R^2 = 0.34$). The same applies to maltreatment models in other studies that were built in several steps (Grassi-Oliveira & Stein, 2008), or did not include all maltreatment types (Spertus et al., 2003). However, the range of the PTSD severity scores in our data was restricted, because a sample of treatment seeking Ch-PTSD patients was investigated. Thus, the lower ranges of PTSD severity were underrepresented in our sample, and in samples that also include patients with no or limited levels of childhood maltreatment and PTSD, correlations between these factors might be higher.

Several additional findings are worth mentioning. First, age positively predicted self-reported PTSD severity related to other traumatic experiences than the index trauma. Traumatic experiences might cumulate as patients grow older, but it is surprising that this finding was not observed for other PTSD outcomes, such as the CAPS-5. Therefore, it is unclear how this finding could be explained, and it might have occurred by chance. Second, emotional and sexual abuse, and emotional neglect appeared the most frequent maltreatment types, partly consistent with frequencies that have already been reported (Pérez-Fuentes et al., 2013; Witt et al., 2017).

The exact nature of the interplay between emotional abuse, other psychological factors, and PTSD severity is an important issue for future research. Although emotional abuse is one of the most frequent types of abuse, it often goes unnoticed, thereby exposing children to emotional abuse more frequently and for longer periods of time compared to more conspicuous types of abuse and neglect. Moreover, emotional abuse could influence negative appraisals of traumatic events. These appraisals (e.g., I am bad) in turn might

Table 2
Frequencies of trauma exposure within each category of the CTQ subscales.

Trauma type	None N (%)	Low N (%)	Moderate N (%)	Severe N (%)
Sexual abuse	15 (10.2%)	5 (3.4%)	15 (10.2%)	112 (76.2%)
Physical abuse	39 (26.5%)	23 (15.6%)	22 (15%)	63 (42.9%)
Emotional abuse	8 (5.4%)	19 (12.9%)	20 (13.6%)	100 (68%)
Physical neglect	19 (12.9%)	26 (17.7%)	43 (29.3%)	59 (40.1%)
Emotional neglect	20 (13.6%)	11 (7.5%)	19 (12.9%)	97 (66%)

Table 3
All models coefficients of all CTQ subscales predicting the CAPS-5 total score.

Variable	B	β	T (df)	SE	p	95% CI	r
<i>CAPS PTSD full model (R² = 0.109)</i>							
Female gender	0.060	0.002	0.028 (129)	2.166	0.978	[-4.225, 4.345]	0.002
Age	0.054	0.062	0.751 (129)	0.072	0.454	[-0.088, 0.196]	0.066
Sexual abuse	0.087	0.050	0.595 (129)	0.146	0.553	[-0.202, 0.375]	0.052
Physical abuse	-0.215	-0.117	-1.170 (129)	0.184	0.244	[-0.578, 0.148]	0.102
Emotional abuse	0.722	0.357	3.079 (129)	0.235	0.003	[0.258, 1.186]	0.262
Physical neglect	-0.167	-0.066	-0.629 (129)	0.265	0.530	[-0.692, 0.358]	0.055
Emotional neglect	0.090	0.045	0.402 (129)	0.223	0.688	[-0.351, 0.531]	0.035
<i>CAPS PTSD final model (R² = 0.097)</i>							
Female gender	0.703	0.026	0.335 (133)	2.097	0.738	[-3.445, 4.852]	0.029
Age	0.047	0.053	0.682 (133)	0.068	0.497	[-0.089, 0.182]	0.059
Emotional abuse	0.601	0.297	3.797 (133)	0.158	<0.001	[0.288, 0.913]	0.313
<i>CAPS intrusions full model (R² = 0.076)</i>							
Female gender	-0.243	-0.028	-0.330 (129)	0.711	0.742	[-1.640, 1.171]	0.029
Age	0.021	0.077	0.892 (129)	0.024	0.374	[-0.026, 0.068]	0.078
Sexual abuse	0.007	0.012	0.143 (129)	0.048	0.886	[-0.088, 0.101]	0.013
Physical abuse	-0.035	-0.060	-0.577 (129)	0.060	0.565	[-0.154, 0.084]	0.051
Emotional abuse	0.219	0.342	2.838 (129)	0.077	0.005	[0.066, 0.371]	0.242
Physical neglect	0.044	0.055	0.506 (129)	0.087	0.614	[-0.128, 0.216]	0.045
Emotional neglect	-0.094	-0.150	-1.290 (129)	0.073	0.199	[-0.239, 0.050]	0.113
<i>CAPS intrusions final model (R² = 0.065)</i>							
Female gender	-0.154	-0.018	-0.224 (133)	0.688	0.823	[-1.515, 1.207]	0.019
Age	0.012	0.043	0.532 (133)	0.022	0.595	[-0.032, 0.056]	0.046
Emotional abuse	0.158	0.248	3.052 (133)	0.052	0.003	[0.056, 0.261]	0.256
<i>CAPS avoidance^a full model (R² = 0.022)</i>							
Female gender	0.016	0.004	-0.039 (129)	0.771	0.963	[-0.689, 0.722]	0.004
Age	-0.002	-0.018	-0.263 (129)	0.357	0.838	[-0.026, 0.021]	0.018
Sexual abuse	-0.019	-0.072	-0.806 (129)	0.012	0.424	[-0.066, 0.028]	0.070
Physical abuse	-0.030	-0.107	-0.993 (129)	0.024	0.320	[-0.090, 0.029]	0.088
Emotional abuse	0.058	0.186	1.491 (129)	0.030	0.138	[0.019, 0.134]	0.130
Physical neglect	-0.019	-0.049	-0.443 (129)	0.039	0.664	[-0.106, 0.067]	0.038
Emotional neglect	-0.013	-0.043	-0.342 (129)	0.044	0.721	[-0.085, 0.060]	0.032
<i>CAPS negative cognitions and emotions full model (R² = 0.127)</i>							
Female gender	0.451	0.035	0.424 (129)	1.064	0.672	[-1.654, 2.556]	0.037
Age	0.027	0.065	0.759 (129)	0.035	0.449	[-0.043, 0.097]	0.067
Sexual abuse	0.100	0.120	1.415 (129)	0.071	0.159	[-0.040, 0.240]	0.124
Physical abuse	-0.156	-0.177	-1.732 (129)	0.090	0.086	[-0.335, 0.022]	0.151
Emotional abuse	0.270	0.279	2.339 (129)	0.115	0.021	[0.042, 0.498]	0.202
Physical neglect	-0.090	-0.074	-0.691 (129)	0.130	0.491	[-0.347, 0.167]	0.061
Emotional neglect	0.149	0.157	1.356 (129)	0.110	0.177	[-0.068, 0.366]	0.119
<i>CAPS negative cognitions and emotions final model (R² = 0.087)</i>							
Female gender	0.899	0.175	0.860 (133)	1.045	0.391	[-1.168, 2.966]	0.074
Age	0.024	0.005	0.716 (133)	0.034	0.475	[-0.043, 0.092]	0.062
Emotional abuse	0.269	0.049	3.299 (133)	0.079	0.001	[0.104, 0.416]	0.275
<i>CAPS arousal full model (R² = 0.079)</i>							
Female gender	-0.217	-0.024	-0.294 (129)	0.739	0.769	[-1.679, 1.245]	0.026
Age	0.017	0.059	0.693 (129)	0.025	0.489	[-0.032, 0.066]	0.061
Sexual abuse	0.007	0.013	0.146 (129)	0.050	0.884	[-0.091, 0.105]	0.013
Physical abuse	0.000	0.000	0.003 (129)	0.063	0.998	[-0.124, 0.124]	0.000
Emotional abuse	0.164	0.244	2.048 (129)	0.080	0.043	[0.006, 0.322]	0.177
Physical neglect	-0.113	-0.133	-1.244 (129)	0.090	0.216	[-0.292, 0.067]	0.109
Emotional neglect	0.071	0.107	0.930 (129)	0.076	0.354	[-0.080, 0.221]	0.082
<i>CAPS arousal final model (R² = 0.069)</i>							
Female gender	-0.105	-0.012	-0.147 (133)	0.714	0.883	[-1.517, 1.307]	0.013
Age	0.023	0.078	0.973 (133)	0.023	0.332	[-0.023, 0.069]	0.084
Emotional abuse	0.161	0.240	2.992 (133)	0.054	0.003	[0.055, 0.268]	0.251

^a There was no reduced model, as the model selection procedure did not identify any predictors. CAPS = Clinician Administered PTSD Scale for DSM-5.

mediate the relationship between social support and PTSD severity (Hitchcock et al., 2015). If primary caretakers respond negatively to children who have experienced trauma, this might substantially increase its negative effects. Emotional abuse is also thought to have a negative impact on attachment schemas and our sense of trust and self-worth (Doyle, 2001), and appears to have negative influences on neurological development due to its effect on stress responses (Yates, 2007). Therefore, emotional abuse might also have an

Table 4
All models coefficients of all CTQ subscales predicting the PCL-5 subscales.

Variable	B	β	T (df)	SE	p	95% CI	r
<i>PCL-5 index trauma full model (R² = 0.124)</i>							
Female gender	-0.407	-0.011	-0.128 (130)	3.187	0.899	[-6.531, 6.208]	0.011
Age	0.159	0.126	1.504 (130)	0.106	0.135	[-0.043, 0.381]	0.131
Sexual abuse	0.079	0.031	0.369 (130)	0.213	0.713	[-0.334, 0.517]	0.032
Physical abuse	-0.016	-0.006	-0.058 (130)	0.271	0.954	[-0.540, 0.540]	0.005
Emotional abuse	1.108	0.379	3.212 (130)	0.345	0.002	[0.446, 1.827]	0.271
Physical neglect	-0.159	-0.043	-0.406 (130)	0.392	0.686	[-0.954, 0.603]	0.036
Emotional neglect	-0.214	-0.075	-0.662 (130)	0.323	0.509	[-0.913, 0.400]	0.058
<i>PCL-5 index trauma final model (R² = 0.121)</i>							
Female gender	0.329	0.009	0.108 (134)	3.049	0.914	[-5.702, 6.360]	0.009
Age	0.144	0.114	1.434 (134)	0.100	0.154	[-0.055, 0.342]	0.123
Emotional abuse	0.914	0.313	3.922 (134)	0.233	<0.001	[0.453, 1.375]	0.321
<i>PCL-5 all other traumas full model (R² = 0.187)</i>							
Female gender	0.211	0.005	0.064 (130)	3.277	0.949	[-6.271, 6.693]	0.006
Age	0.291	0.215	2.687 (130)	0.108	0.008	[0.077, 0.506]	0.229
Sexual abuse	0.136	0.050	0.615 (130)	0.220	0.540	[-0.300, 0.572]	0.054
Physical abuse	-0.113	-0.039	-0.405 (130)	0.279	0.686	[-0.664, 0.439]	0.035
Emotional abuse	0.633	0.201	1.787 (130)	0.354	0.076	[-0.068, 1.334]	0.155
Physical neglect	0.597	0.150	1.481 (130)	0.403	0.141	[-0.200, 1.394]	0.129
Emotional neglect	0.213	0.069	0.641 (130)	0.332	0.522	[-0.444, 0.871]	0.056
<i>PCL-5 all other traumas final model (R² = 0.167)</i>							
Female gender	-0.529	-0.013	-0.167 (134)	3.170	0.867	[-6.799, 5.741]	0.014
Age	0.281	0.207	2.703 (134)	0.104	0.010	[0.075, 0.487]	0.227
Emotional abuse	1.008	0.320	4.162 (134)	0.242	<0.001	[0.529, 1.487]	0.338

Note. PCL-5 = PTSD Checklist for DSM-5.

aggravating effect through other factors, such as attachment and stress responses.

The exact nature of the interplay of emotional abuse and other types of abuse in the development of PTSD is similarly unclear. One possibility is that the psychological impact of emotional abuse has more negative consequences, and leads to more negative appraisals compared to the pain and harm associated with physical or sexual abuse. In our clinical experience, many patients comment that negative things that were said by perpetrators during physical abuse were more painful than the physical pain itself, and that following sexual abuse the emotional blackmail or the negative response when trying to find consolation from a caregiver were the most damaging. Such explanations remain speculations and raise interesting new hypotheses that should be tested in other samples and study designs.

Several limitations need to be considered. First, given the correlational cross-sectional design, we cannot draw causal conclusions, although our findings do suggest the presence of a temporal relationship between childhood maltreatment and PTSD in adulthood. Second, it is unclear to what degree results can be generalized to other populations, such as adults who have not experienced Criterion-A traumas. Third, similarly to other studies, exposure to maltreatment was assessed with the CTQ, a self-report measure of retrospective accounts of childhood experiences. Patients might not be able to fully and reliably recall childhood experiences, although one study corroborates the reliability of retrospective recall of abuse (Hardt & Rutter, 2004). Avoidance might also play a role in the reporting of negative childhood experiences (e.g., avoidance leading to underreporting). Therefore, it is unclear to what degree the CTQ is a valid instrument to assess childhood experiences in highly avoidant PTSD patients. Fourth, although comparable to other studies (Bernstein et al., 2003; Hoeboer et al., 2020), the internal consistency of the physical neglect subscale was rather low, which could explain why this subscale did not predict the outcomes in this study. Fifth, the variation in the reporting of the maltreatment types and absence of multicollinearity between the different maltreatment types suggests that they are separate predictors of PTSD severity. However, it might still be possible that this is not the case, and it should be noted that the present analyses remain a simplification of reality.

The fundamental issue that should be the subject of future studies and debate about future formulations of PTSD, is the relative importance of non-physical trauma and physical trauma in leading to the clinical manifestations that we describe as PTSD. We recommend that future research attempts to replicate our findings in additional outpatient groups without a main PTSD diagnosis and without exposure to Criterion-A-traumas. This would further enhance the generalizability of the findings to other populations and controlled comparisons with these different groups would also allow stronger causal conclusions. Additionally, it is possible that different patterns emerge if maltreatment types are studied on a more detailed level. For example, sexual abuse consists of a broad range of experiences (e.g., harassment, rape). Another interesting avenue for future research is the influence of emotional abuse and other trauma types on treatment outcomes. This could provide important practical information for interventions, such as stimulating therapists and studies to also focus on the treatment of traumatic memories related to emotional abuse.

The present study has several important strengths. We examined the relationship between childhood maltreatment types and PTSD in an adult sample. The interplay between childhood maltreatment types and PTSD severity in adults compared to children and adolescents might differ, as time passes and patients are exposed to more traumatic experiences. Additionally, the participants in the

current study experienced childhood trauma in accordance with the DSM-5 Criterion-A before the age of 16 but had often also experienced other trauma types. For this reason, we also included multiple PTSD severity measures, as participants experienced multiple traumas and only using the PCL-5 index trauma scale would yield an incomplete assessment. This also informed us about the generalizability of our findings. Using a model selection procedure to examine the essential predictors also goes beyond testing different trauma types separately or in a single model.

In sum, the present study provides important new insights into the relationship between childhood maltreatment and PTSD. The experience of emotional abuse in childhood appears to contribute to PTSD symptoms that are caused by DSM-5 defined trauma, although the exact mechanisms that underlie this relationship remain open to further investigation. This not only underscores the importance of an emotionally safe environment in childhood, but also implies that memories of emotional abuse should receive a stronger focus during the screening, assessment, and treatment of PTSD.

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Declaration of competing interest

None.

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