


# Developmental Trauma Disorder: A Legacy of Attachment Trauma in Victimized Children

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Developmental trauma disorder (DTD) and posttraumatic stress disorder (PTSD) have been found to have both shared and unique traumatic antecedents. The present study was an independent replication, with the DTD Structured Interview and the Traumatic Events Screening Instrument administered to 271 children in mental health treatment in six U.S. sites. On an unadjusted basis, DTD (27.3% prevalence,  $N = 74$ ) and PTSD (40.2% prevalence,  $N = 109$ ) both were associated with traumatic physical assault or abuse, family violence, emotional abuse, caregiver separation or impairment, and polyvictimization. After controlling for PTSD, DTD was associated emotional abuse,  $OR = 2.9$ , 95% CI [1.19, 6.95], and traumatic separation from a primary caregiver,  $OR = 2.2$ , 95% CI [1.04, 4.60], both of which also were associated with caregiver impairment, physical assault/abuse, and witnessing family/community violence. Three traumatic antecedents associated with PTSD were not associated with DTD: noninterpersonal trauma, sexual trauma, and traumatic loss. Children exposed to both traumatic victimization and attachment trauma (36.2%) or attachment trauma alone (32.5%) were more likely than children exposed only to victimization (17.5%) or those with no history of victimization or attachment trauma (8.1%) to meet the symptom criteria for DTD,  $\chi^2(3, N = 271) = 17.68, p < .001$ . Study findings replicate and extend prior DTD field trial study results, showing that, although PTSD and DTD share traumatic antecedents, DTD is uniquely associated with traumatic emotional abuse and caregiver separation. Further research is needed to examine how specific trauma types contribute to the risk, course, and severity of DTD.

Developmental trauma disorder (DTD) is a childhood syndrome that was formulated to complement and extend

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the posttraumatic stress disorder (PTSD) diagnosis with 15 symptoms of emotional/somatic, cognitive/behavioral, and self/relational dysregulation (Table 1) that are documented sequelae of traumatic victimization and disrupted attachment bonding with primary caregivers (D'Andrea et al., 2012) but extend beyond the symptoms of PTSD (Ford, Grasso, et al., 2013; Ford et al., 2018). The criteria for a DTD diagnosis includes symptoms similar to those comprising the “disturbances of self-organization” component of the complex PTSD (CPTSD) diagnostic criteria in the 11th revision of the *International Classification of Diseases (ICD-11)*; Haselgruber et al., 2020) but with adaptations consistent with the developmental psychology of childhood and adolescence (e.g., assessing self-other boundary confusion and reactive aggression, negative self-appraisals and relational detachment). Although DTD was proposed as a diagnosis in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, it was rejected due to a lack of empirical evidence at that time. However, evidence consistent with a hypothesized link between symptoms of DTD and past exposure to both victimization and attachment traumas was found in a subsequent study (Spinazzola et al., 2018). In light of the need for replication in psychological science (Lindsay, 2015), the current study was conducted to determine if the findings concerning the traumatic antecedents of DTD can be independently replicated.

**Table 1**  
*Developmental Trauma Disorder (DTD) Diagnostic Criteria*

Criterion	Subcriteria
Criterion A: Lifetime contemporaneous exposure to both types of developmental trauma	<ul style="list-style-type: none"> <li>• A1: traumatic interpersonal victimization</li> <li>• A2: traumatic disruption in attachment bonding with primary caregiver(s)</li> </ul>
Criterion B: Current emotion or somatic dysregulation (4 items; 3 required for DTD)	<ul style="list-style-type: none"> <li>• B1: Emotion dysregulation</li> <li>• B2: Somatic dysregulation</li> <li>• B3: Impaired access to emotion or somatic feelings</li> <li>• B4: Impaired verbal mediation of emotion or somatic feelings</li> </ul>
Criterion C: Current attentional or behavioral dysregulation (5 items; 2 required for DTD)	<ul style="list-style-type: none"> <li>• C1: Attention bias toward or away from threat</li> <li>• C2: Impaired self-protection</li> <li>• C3: Maladaptive self-soothing</li> <li>• C4: Nonsuicidal self-injury</li> <li>• C5: Impaired ability to initiate or sustain goal-directed behavior</li> </ul>
Criterion D: Current relational- or self-dysregulation (6 items; 2 required for DTD)	<ul style="list-style-type: none"> <li>• D1: Self-loathing or self viewed as irreparably damaged and defective</li> <li>• D2: Attachment insecurity and disorganization</li> <li>• D3: Betrayal-based relational schemas</li> <li>• D4: Reactive verbal or physical aggression</li> <li>• D5: Impaired psychological boundaries</li> <li>• D6: Impaired interpersonal empathy</li> <li>• D6: Impaired interpersonal empathy</li> </ul>

Traumatic victimization is relevant for DTD based on its profound effects on children's neurodevelopment, relationships, learning, and health (D'Andrea et al., 2012; Teicher & Samson, 2016). When multiple forms of victimization occur (i.e., polyvictimization), the sequelae often are complex and can persist for decades (Thoma et al., 2021) and intergenerationally (Greene et al., 2020). Interpersonal victimization in childhood has also been associated with and predictive of the risk for disruption in attachment (Lim et al., 2020). The combination of victimization and insecure or anxious attachment (Noonan & Pilkington, 2020) has been associated with and predictive of PTSD and depression symptoms in children (Lim et al., 2020) as well as complex PTSD symptoms (e.g., affect dysregulation, dissociation) in adulthood (Van Dijke et al., 2013).

Although research shows that traumatic victimization and attachment disruption have complex sequelae in childhood that are consistent with the symptoms posited to characterize DTD, it is necessary to determine whether the DTD symptoms actually are empirically associated with those traumatic antecedents. For DTD to have clinical utility as a diagnosis, it also must have traumatic antecedents that are distinct from those of PTSD (Ford, Grasso, et al., 2013). The present study, therefore, was designed to test two hypotheses. First, we hypothesized that DTD would be associated with a history of both traumatic victimization and disrupted relationships with primary caregivers, independent of the effect of PTSD. Second, based on evidence that cumulative exposure to traumatic adversity

in childhood is associated with increasingly severe multidomain emotional and behavioral problems (Lueger-Schuster et al., 2018), we posited that DTD would be most likely to be identified in children who experienced both traumatic victimization and attachment disruption compared to those who experienced either traumatic victimization alone, attachment disruption alone, or neither of these types of trauma.

## Method

### Participants and Procedure

A convenience sample of 271 children ages 8–18 years old ( $M = 12.1$  years,  $SD = 2.9$ ; 47.2% female) from varied ethnocultural backgrounds (i.e., 50.6% White non-Hispanic, 31.0% Black or biracial, 10.0% Latino/Hispanic; 5.4% Asian American or other) was recruited between October 2014 and November 2016 at three sites in the Northeastern United States and three sites on the West Coast of the United States sites, including urban, suburban, and rural communities. Parent or guardian consent and child assent were obtained following an Institutional Review Board–approved protocol. Interviews were conducted with 152 parent–child dyads conjointly, 113 parents alone, and six youths age 13 years or older alone. All children were in mental health treatment, as outpatients ( $n = 226$ , 83.4%) or in residential programs ( $n = 45$ , 16.7%). One third of the children ( $n = 92$ , 33.9%) lived with both birth parents, and one third lived either with their step-family ( $n = 39$ , 14.4%) or foster or adoptive family ( $n = 51$ , 18.8%). Other

children lived with relatives or nonrelative families ( $n = 44$ , 16.4%) or in residential treatment centers ( $N = 45$ , 16.7%).

Based on the Kiddie Schedule for Affective Disorders and Schizophrenia–Present/Lifetime Version (KSADS-PL), all participants met the criteria for at least one probable psychiatric diagnosis other than PTSD ( $Mdn = 4$ ), including major depression ( $n = 168$ , 62.0%), generalized anxiety disorder ( $n = 157$ , 58.0%), attention deficit/hyperactivity disorder ( $n = 144$ , 53.1%), oppositional defiant disorder ( $n = 135$ , 49.7%), separation anxiety disorder ( $n = 121$ , 44.6%), conduct disorder ( $n = 65$ , 24.0%), phobia ( $n = 64$ , 23.7%), bipolar disorder ( $n = 41$ , 15.1%), obsessive–compulsive disorder ( $n = 27$ , 10.0%), psychotic disorder ( $n = 26$ , 9.6%), and eating disorder ( $n = 15$ , 5.5%).

Interviewers ( $N = 25$ ) viewed simulated interviews conducted by expert assessors, then independently rated videotaped interviews until achieving greater than 80% agreement with expert ratings and conducted and rated videotaped role-play interviews with higher than 90% agreement with an expert's review. The interviewers' first two study interview tapes were reviewed by an expert, with greater than 90% agreement required for calibration. Subsequently, a randomly selected 31 interviews with a parent or adult guardian and 15 interviews with a child were independently rated for reliability.

## Measures

### DTD

The Developmental Trauma Disorder Semi-Structured Interview (DTD-SI) was used to assess the symptoms of DTD. The DTD-SI includes 15 items related to affect dysregulation (four items), cognitive and behavioral dysregulation (five items), and self- or relational dysregulation (six items), with symptoms scored as “present” or “absent.” The total and factor-analytically derived subscale validity and interrater reliability of the DTD-SI were previously confirmed in an independent sample (Ford et al., 2018). In the current study, the interrater agreement for all items was 87%–100% ( $M = 93.0%$  for child interviews,  $M = 93.5%$  for parent or guardian interviews). To avoid an a priori association between DTD and any trauma antecedent or antecedents, DTD was ascertained based only on its symptom criteria (i.e., three or more affect symptoms, two or more cognitive/behavioral symptoms, and two or more self/relational symptoms).

### Lifetime Trauma Exposure

The Traumatic Experiences Screening Instrument (TESI; Daviss et al., 2000), a semistructured interview used to assess 10 composite types of lifetime traumatic stressors that correspond with *DSM-IV* Criterion A, was used to evaluate participants' trauma history. Based on Alisic et al.'s (2014) meta-analysis, traumatic events involving accidents, illness, or disaster were classified as “noninterpersonal,” and nine additional traumatic stressors involving interpersonal relationships or interaction (i.e., loss, caregiver separation, caregiver

impairment, neglect, emotional abuse, physical abuse or assault, family violence, community violence, sexual abuse) were classified as “interpersonal.” Polyvictimization was classified based on exposure to five or more of the nine possible interpersonal trauma types, which represents the top 10th percentile. Items on the TESI have demonstrated test–retest reliability over a 2–4-month period ( $\kappa = .50$ – $.70$ ) and criterion and predictive validity (Daviss et al., 2000). In the present study, the interrater agreement for TESI trauma types was 88%–100% ( $M = 97.7%$  for child interviews,  $M = 97.4%$  for parent and guardian interviews).

### Psychiatric Disorders

The KSADS/PL (Jarbin et al., 2017) was used to assess psychiatric disorders. This interview has been validated for *DSM-IV* disorders, including PTSD, with child and parent versions. In the present study, the interrater agreement for PTSD items was 81%–100% ( $M = 85.7%$  for child interviews,  $M = 89.4%$  for parent/guardian interviews).

### Data Analysis

Pearson correlations were conducted to examine bivariate associations among the childhood traumatic antecedent variables, followed by cross-tabulation analyses with odds ratios (ORs) and 95% confidence intervals to examine the unadjusted associations between age, sex, ethnicity, and family status and DTD, PTSD, and trauma history variables. We tested our first hypothesis by calculating unadjusted odds ratios and 95% confidence intervals for DTD and PTSD with each trauma history variable, followed by two multiple logistic regression analyses of the associations between each trauma history variable and DTD, including PTSD as a predictor, and PTSD, including DTD as a predictor. To test the second hypothesis, cross-tabulations were conducted comparing the likelihood of a DTD diagnosis and each DTD symptom criterion for four subgroups of children, including those who (a) met the full DTD stressor criterion (i.e., A1 [interpersonal victimization] and A2 [attachment trauma]), (b) met only Criterion A1, (c) met only Criterion A2, or (d) met neither Criterion A1 nor Criterion A2.

## Results

### Associations between PTSD, DTD, and Trauma History Variables

One quarter of the sample met the criteria for DTD ( $n = 74$ , 27.1%), and 39.5% of the sample met the criteria for PTSD ( $n = 107$ ). Two thirds of the DTD cases also met the criteria for PTSD ( $n = 51$ , 68.9%), representing 47.7% of the PTSD cases. Comorbid DTD/PTSD cases represented 18.8 of the overall sample. In contrast, more than half of the PTSD cases did not meet the criteria for DTD ( $n = 56$ , 52.3%), and approximately half of the sample had neither DTD nor PTSD ( $n = 141$ , 52.0%).

Two thirds of the bivariate correlations among the trauma history variables were statistically significant,  $p < .05$ , generally of small magnitude,  $Mdn r = .165$ ,  $p = .006$  (see Supplementary Table S1). The most strongly correlated trauma history variables were (a) caregiver separation, caregiver impairment, and family violence,  $r_s = .28-.38$ ; (b) caregiver separation and neglect,  $r = .35$ ; and (c) emotional abuse with family violence and physical abuse or assault,  $r_s = .30-.31$ ,  $ps < .001$ .

**Sociodemographic Correlates of DTD, PTSD, and Trauma History Variables**

Age was unrelated to the presence of DTD or PTSD, but adolescents (i.e., 13–18 years old) were more likely than children (i.e., 7–12 years old) to have experienced a traumatic loss,  $OR = 2.53$ , 95% CI [1.51, 4.26]; sexual trauma,  $OR = 2.03$ , 95% CI [1.12, 3.69]; or emotional abuse,  $OR = 2.17$ , 95% CI [1.17, 4.00] (see Supplementary Table S2). Sex was unrelated to DTD, PTSD, or trauma exposure. Ethnocultural background was unrelated to DTD and PTSD, but Black or Hispanic children were more likely than White children to have experienced community violence,  $OR = 2.65$ , 95% CI [1.30, 5.38], whereas White children were more likely to have experienced traumatic family violence,  $OR = 1.87$ , 95% CI [1.07, 3.26]. Living apart from one’s birth family was not related to DTD or PTSD but was related to traumatic physical abuse or assault,  $OR = 2.48$ , 95% CI [1.41, 4.00]; family violence,  $OR = 3.57$ , 95% CI [1.89, 6.67]; emotional abuse,  $OR = 5.10$ , 95% CI [2.02, 12.50]; sexual trauma,  $OR = 2.86$ , 95% CI [1.35, 5.88]; neglect,  $OR = 7.46$ , 95% CI [2.23, 25.00]; caregiver separation,  $OR = 4.67$ , 95% CI [2.56, 8.55]; caregiver impairment,  $OR = 3.01$ , 95% CI [1.79, 5.08]; and polyvictimization,  $OR = 5.99$ , 95% CI [1.77, 20.00].

**Is DTD Uniquely Related to Victimization and Attachment Disruption?**

With regard to the first study hypothesis, the results of binary logistic regressions demonstrated that DTD, log-likelihood = 16.21–24.37, Nagelkerke  $R^2 = .03-.08$ , and PTSD, log-likelihood = 23.02–42.59, Nagelkerke  $R^2 = .06-.15$ , both were associated with several types of traumatic victimization and attachment traumas (Table 2), including physical assault or abuse, family violence, emotional abuse, separation from a caregiver, caregiver impairment, and polyvictimization. In addition, PTSD—but not DTD—was associated with noninterpersonal trauma and traumatic loss, community violence, sexual trauma, and neglect, log-likelihood = 17.74–24.74, Nagelkerke  $R^2 = .04-.07$ . In multiple logistic regressions with all trauma history variables simultaneously entered along with PTSD (Table 3), traumatic emotional abuse and caregiver separation were significantly associated with DTD, with a statistically significant overall model,  $\chi^2(16, N = 271) = 90.46$ , log-likelihood = 217.65, Nagelkerke  $R^2 = .42$ . In a parallel analysis that controlled for DTD, PTSD was associated with traumatic physical abuse or assault and caregiver

**Table 2** Unadjusted Associations Between Developmental Trauma Disorder (DTD) and Posttraumatic Stress Disorder (PTSD) and Trauma History Variables

Type of childhood trauma <sup>a</sup>	DTD			PTSD		
	OR	95% CI	$\chi^2(1, N = 271)$	OR	95% CI	$\chi^2(1, N = 271)$
Noninterpersonal trauma <sup>a</sup>	1.20	[0.54, 2.67]	0.43	3.97	[1.58, 9.76]	9.71**
Traumatic loss	1.21	[0.69, 2.11]	1.96	2.76	[1.61, 4.76]	13.91***
Physical abuse/assault	1.96	[1.14, 3.38]	5.97*	3.57	[2.13, 5.96]	24.44***
Family violence	2.44	[1.40, 4.25]	10.20**	2.91	[1.72, 4.92]	16.39***
Community violence	1.72	[0.89, 3.31]	2.68	2.41	[1.29, 4.53]	7.81**
Sexual trauma	1.08	[0.56, 2.08]	0.57	3.01	[1.64, 5.51]	13.32***
Emotional abuse	3.41	[1.82, 6.38]	15.70***	3.21	[1.72, 5.98]	14.31***
Traumatic neglect	1.83	[0.90, 3.73]	2.86	3.27	[1.61, 6.63]	11.56**
Traumatic caregiver separation	2.98	[1.72, 5.17]	15.67***	2.45	[1.49, 4.06]	12.52***
Traumatic caregiver impairment	2.40	[1.35, 4.27]	9.08**	4.53	[2.62, 7.85]	31.01***
Polyvictimization	2.53	[1.20, 5.33]	6.24*	4.98	[2.21, 11.21]	17.38***

Note. OR = odds ratio.

<sup>a</sup> Accident, illness, or disaster.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 3**  
Multiple Logistic Regression Analyses

Variable	<i>B</i>	<i>SE</i>	Wald <i>F</i>	<i>df</i>	<i>p</i>	<i>OR</i>	95% <i>CI</i>
Outcome variable: DTD							
Age	0.043	0.059	0.515	1	.473	1.043	[0.929, 1.172]
Sex	0.406	0.333	1.488	1	.223	1.501	[0.782, 2.882]
White vs. non-White	0.707	0.383	3.840	1	.050	2.027	[0.998, 4.111]
Intact biological family	-0.002	0.383	0.000	1	.996	0.998	[0.471, 2.115]
Noninterpersonal trauma	-0.941	0.599	2.466	1	.116	0.390	[0.121, 1.283]
Traumatic loss	-0.265	0.406	0.426	1	.514	0.769	[0.347, 1.700]
Physical abuse/assault	0.225	0.367	0.378	1	.539	1.253	[0.611, 2.570]
Family violence	0.542	0.387	1.960	1	.162	1.750	[0.805, 3.675]
Sexual trauma	-0.738	0.448	2.710	1	.100	0.478	[0.198, 1.151]
Community violence	0.642	0.424	2.296	1	.130	1.900	[0.828, 4.357]
Emotional abuse	1.055	0.451	5.477*	1	.019	2.873	[1.187, 6.953]
Traumatic neglect	-0.047	0.477	0.010	1	.921	0.954	[0.375, 2.427]
Traumatic separation	0.781	0.380	4.124*	1	.040	2.183	[1.036, 4.600]
Caregiver impairment	0.132	0.403	0.106	1	.744	1.141	[0.518, 2.513]
Polyvictimization	-0.562	0.614	0.840	1	.359	0.570	[0.171, 1.897]
PTSD diagnosis	1.700	0.362	22.067***	1	<.001	5.473	[2.693, 11.124]
Outcome variable: PTSD							
Age	0.040	0.058	0.481	1	.488	1.041	[0.929, 1.166]
Sex	-0.377	0.316	1.424	1	.233	0.686	[0.370, 1.275]
White vs. non-White	-0.077	0.336	0.052	1	.820	0.926	[0.480, 1.789]
Intact biological family	0.370	0.367	1.020	1	.313	1.448	[0.706, 2.972]
Noninterpersonal trauma	0.157	0.633	0.062	1	.804	1.170	[0.338, 4.030]
Traumatic loss	0.525	0.381	1.936	1	.164	1.699	[0.805, 3.586]
Physical abuse/assault	0.909	0.339	7.197**	1	.007	2.481	[1.277, 4.820]
Family violence	0.114	0.371	0.094	1	.766	1.121	[0.541, 2.321]
Sexual trauma	0.729	0.408	3.192	1	.074	2.074	[0.932, 4.615]
Community violence	0.231	0.414	0.312	1	.576	1.260	[0.560, 2.837]
Emotional abuse	0.351	0.468	0.564	1	.453	1.421	[0.568, 3.556]
Traumatic neglect	0.548	0.474	1.341	1	.247	1.731	[0.684, 4.739]
Traumatic separation	0.090	0.362	0.072	1	.804	1.094	[0.539, 2.223]
Caregiver impairment	0.998	0.364	7.528**	1	.006	2.723	[1.330, 5.535]
Polyvictimization	-0.221	0.644	0.117	1	.732	0.802	[0.227, 2.832]
DTD diagnosis	1.618	0.361	20.089***	1	<.001	5.044	[2.486, 10.235]

Note. PTSD = posttraumatic stress disorder; DTD = developmental trauma disorder; *OR* = odds ratio.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

impairment, with a significant overall model,  $\chi^2(16, N = 271) = 98.84$ , log-likelihood = 253.16, Nagelkerke  $R^2 = .43$ .

### Is DTD Associated With Both Victimization and Attachment Disruption?

The results of a cross-tabulation of the DTD symptom-only diagnosis with DTD Criterion A (see Table 4) showed that the symptom-based diagnosis was present in 37.6% of the cases in which both Criterion A1 and Criterion A2 were present (i.e.,

53 of 141 cases) and in 32.4% of the cases in which only Criterion A2 was present (i.e., 11 of 34 cases), but in only 17.4% of the cases in which only Criterion A1 was present (i.e., 8 of 46 cases) and less than 10% of the cases in which neither Criterion A1 (i.e., traumatic victimization) nor Criterion A2 (i.e., traumatic attachment disruption) was present (i.e., 4 of 50 cases),  $\chi^2(3, N = 271) = 17.68$ ,  $p < .001$ . Approximately two thirds of all cases that met the symptom criteria for DTD also met the full Criterion A (i.e., 51 of 74 cases). Children who met the full Criterion A were more likely than those who met only

**Table 4**

Associations Between Developmental Trauma Disorder (DTD) and Posttraumatic Stress Disorder (PTSD) Diagnoses and DTD Criterion A

Variable	No DTD Criterion A		Criterion A1 Only		Criterion A2 Only		Criterion A (A1 + A2)		Total sample	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
DTD	4	8.0	8	17.4	11	32.5	51	36.2	74	27.3
No DTD	46	92.0	38	82.6	23	67.5	90	63.8	197	72.7
$\chi^2(3, N = 271) = 17.68^{***}$										
DTD-B	5	10.0	10	21.8	12	35.3	66	46.8	93	34.3
No DTD-B	45	90.0	36	78.2	22	64.7	75	53.2	178	65.7
$\chi^2(3, N = 271) = 26.12^{***}$										
DTD-C	11	22.0	17	37.0	20	58.8	95	67.5	143	52.8
No DTD-C	39	78.0	29	63.0	14	41.2	46	32.5	128	47.2
$\chi^2(3, N = 271) = 36.18^{***}$										
DTD-D	14	28.0	21	45.7	16	47.0	43	69.5	94	52.7
No DTD-D	36	72.0	25	54.3	18	53.0	98	30.5	177	65.3
$\chi^2(3, N = 271) = 29.20^{***}$										
PTSD	3	6.0	14	30.5	9	26.5	81	57.5	107	39.5
No PTSD	47	94.0	32	69.5	25	73.5	60	42.5	164	60.5
$\chi^2(3, N = 271) = 46.89^{***}$										

Note. DTD-B = DTD Criterion B; DTD-C = DTD Criterion C; DTD-D = DTD Criterion D.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Criterion A1 (i.e., victimization) or neither Criterion A1 or A2 to meet the symptom criteria for a DTD diagnosis,  $\chi^2(1, N = 187) = 5.66, p = .017$ , and  $\chi^2(1, N = 191) = 14.29, p < .001$ ; however, children who met the full Criterion A were not more likely than those who met Criterion A2 only (i.e., attachment disruption) to meet the symptom criteria for a DTD diagnosis,  $\chi^2(1, N = 175) = 0.17, p = .676$ . Children who met Criterion A2 only,  $\chi^2(1, N = 84) = 8.18, p = .004$ , but not those who met Criterion A1 only,  $\chi^2(1, N = 96) = 1.93, p = .165$  were more likely than those who met neither Criterion A1 nor A2 to meet the DTD symptom criteria (Table 4). Thus, both Criterion A and Criterion A2 were consistently associated with the DTD symptom criteria.

A parallel cross-tabulation analysis of the association between DTD Criterion A and a PTSD diagnosis showed that PTSD was present in 56.7% of the cases in which both Criterion A1 and Criterion A2 were present (i.e., 80 of 141 cases), but only in 26.5% of the cases in which only Criterion A2 was present (i.e., 9 of 34 cases), 30.4% of the cases in which only Criterion A1 was present (i.e., 14 of 46 cases), and 6.0% of the cases in which neither Criterion A1 (i.e., traumatic victimization) nor A2 (i.e., traumatic attachment disruption) was present (i.e., 3 of 50 cases),  $\chi^2(3, N = 271) = 46.89, p < .001$  (Table 4).

## Discussion

The present findings replicate and extend the results of prior research showing that DTD and PTSD are associated with traumatic violence, maltreatment, and caregiver separation and impairment (DePierro et al., 2019; Ford, Grasso, et al., 2013). Our first hypothesis was confirmed in that DTD was associated with traumatic victimization (i.e., emotional abuse) and attachment disruption (i.e., traumatic separation from primary caregiver), independent of the effects of PTSD. The findings partially confirmed our second hypothesis: Children who met DTD Criterion A were more likely than those who met only Criterion A1 (i.e., traumatic victimization) or neither Criterion A1 nor Criterion A2 to meet the DTD symptom criteria. However, children who met only Criterion A2 (i.e., attachment trauma) were equally likely to meet the DTD symptom criteria as those who met full Criterion A.

Thus, the study findings suggest that the operational definition of DTD Criterion A should allow for multiple types of traumatic victimization and attachment disruption. The unique trauma antecedents identified in the present study (i.e., emotional abuse, caregiver separation) paralleled but differed from the forms of victimization (i.e., family and community violence) and attachment trauma (i.e., caregiver impairment)

that were unique antecedents of DTD in the prior DTD study (Spinazzola et al., 2018). Notably, traumatic family violence and caregiver impairment were associated with both DTD and PTSD in the current study. Thus, the combined results of the two studies suggest that DTD Criterion A1 and Criterion A2 should not be limited to any specific type of victimization or attachment trauma and that different combinations of types of each of these domains of traumatic adversity may be antecedents of DTD separately from or comorbid with PTSD.

Further, the difference in the frequency of meeting the DTD symptom diagnostic criteria and the number of DTD symptoms in total and for each DTD symptom subset were not significantly lower for children whose trauma histories included only Criterion A2 (i.e., attachment disruption) than those who met the full Criterion A (i.e., both A1 and A2). By contrast, children who met Criterion A1 (i.e., traumatic victimization) but not A2 were less likely than those who met both A1 and A2 to meet the symptom criteria for a DTD diagnosis. Thus, attachment trauma related to relationships with primary caregivers may play a crucial role in DTD, consistent with prior research findings (Lim et al., 2020; Noonan & Pilkington, 2020; Van Dijke et al., 2013, 2018).

For both PTSD and DTD, the percentage of participants who met the full criteria for Criterion A was approximately double the percentage of participants who met Criterion A1 alone (i.e., 57.5% vs. 30.5% for PTSD, 36.2% vs. 17.4% for DTD). This finding is consistent with evidence that PTSD and CPTSD are related to cumulative trauma exposure (Lueger-Schuster et al., 2018). The percentages were higher for PTSD than DTD, possibly related to the requirement that DTD Criterion A events must meet the *DSM-IV* PTSD definition for traumatic stressors. One implication is that when PTSD is identified in a child with a history of traumatic victimization, DTD should be carefully assessed as a complicating comorbidity, especially when there also is a history of attachment disruption. Further research is warranted with regard to whether there are specific types or combinations of attachment trauma, with or without victimization, or developmental epochs when attachment trauma and victimization occurred, that are specifically related to PTSD or DTD or their combined occurrence.

The finding that traumatic emotional abuse was associated with DTD is consistent with extensive evidence that severe verbal or emotional abuse has complex psychobiological sequelae involving emotional, behavioral, and self- or relational dysregulation that extends beyond PTSD (Cui & Liu, 2020; Spinazzola et al., 2014). In the present study, emotional abuse was associated with both physical abuse or assault and family violence, raising a possibility that these three forms of victimization are a risk-factor caravan (Chen et al., 2015; Layne et al., 2014) for DTD. Traumatic emotional abuse may be a form of attachment trauma when it occurs in the context of a primary caregiving relationship (Cyr et al., 2010). Childhood emotional abuse also is associated with insecure attachment and identity, intimacy, empathy, and self-direction problems

in adolescence (Gander et al., 2020; Goulter et al., 2019; Riva Crugnola et al., 2019) as well as with adult insecure attachment and dissociation, hopelessness, substance abuse, psychosis, and borderline personality disorder (Frias et al., 2016; Goodall et al., 2015; Kong et al., 2018; Scott et al., 2020). Thus, emotional abuse may represent both aspects of trauma exposure in DTD Criterion A (i.e., traumatic victimization and attachment disruption). Consistent with this possibility, in five of the six cases of DTD in which a child met only Criterion A1 (i.e., traumatic victimization), emotional abuse had occurred. Thus, research is needed to determine whether traumatic emotional abuse in a primary caregiving relationship should be identified as an attachment trauma for the purposes of DTD diagnosis.

In the previous DTD study (Spinazzola et al., 2018), traumatic caregiver impairment and separation were combined in a single attachment trauma variable. However, there is evidence that, despite their frequent co-occurrence (Turney & Wildeman, 2017), they represent separate forms of childhood adversity (Turner et al., 2020). Traumatic separation is related to insecure attachment (Briggs-Gowan et al., 2019). Forced separation from a caregiver also is predictive of behavioral health problems over and above the effects of caregiver impairment, neglect, emotional abuse, physical assault or abuse, and community violence (Averdijk et al., 2012; Bufferd et al., 2019; Choi et al., 2020). Traumatic separation also has also been shown to be associated with altered amygdala–prefrontal connectivity (Gee, 2021) and PTSD and attachment insecurity in adulthood (Bryant et al., 2017) as well as with personality problems in adolescence (Malone et al., 2014) and adulthood (Malone et al., 2011). The association between traumatic separation from caregivers and DTD underscores the need for therapeutic interventions targeting separation-related childhood traumatic grief (Cohen & Mannarino, 2019) and traumatically disrupted childhood attachment security (Owen, 2020).

Traumatic loss, as distinct from primary caregiver separation, and noninterpersonal trauma exposure were associated with PTSD but unrelated to DTD in the current study. Neither of these trauma types involves victimization or attachment disruption nor were they more than weakly correlated (*Mdn rs* = .16 and .13, respectively; see Supplementary Table S1) with victimization or attachment disruption variables in the current study. Physical assault or abuse and traumatic caregiver impairment were associated with both PTSD and DTD on an unadjusted basis, but they were associated more strongly and uniquely with PTSD than with DTD. Childhood PTSD, thus, may reflect the impact of threats to safety—both interpersonal and noninterpersonal and that due to losses—on neurodevelopment (Powers et al., 2019; Terpou et al., 2019), whereas DTD may be the sequelae of threats to attachment security (Lim et al., 2020). Consistent with this view, safety threats (i.e., stalking) have been found to be associated with PTSD in adults, whereas attachment threats (e.g., neglect) and adversity that potentially involve both victimization and attachment disruption (e.g., emotional abuse, bullying) have been shown to be associated with CPTSD (Hyland et al., 2021).

The methodological limitations of the present study include the convenience sample, although participants were drawn from intensive outpatient and residential mental health treatment programs in several geographic regions in the United States and had extensive psychiatric morbidity and trauma histories consistent with subpopulations in child mental health treatment (Basu et al., 2020; Ford et al., 1999). Trauma history was assessed using a well-validated and widely used semistructured interview measure but may be subject to retrospective bias (Widom, 2019) and may have false negatives when based only on either child and parent report but not both (Hungerford et al., 2010; Stover et al., 2010). Precise data on the age of onset, chronicity, and other trauma exposure variables associated with youth outcomes (Hodgdon, Liebman, et al., 2018; Hodgdon, Spinazzola, et al., 2018) could not be reported, and exposure may have been underreported by children due to their reluctance to disclose information in a caregiver's presence or to some caregivers' lack of knowledge of events prior to caring for the child. Symptoms of PTSD were assessed based on the *DSM-IV* criteria because the K-SADS for *DSM-5* was not yet available. The assessment of attachment trauma was done indirectly based on traumatic events (e.g., neglect, caregiver separation) and contexts (i.e., caregiver impairment) rather than via direct assessment of child-caregiver attachment. Factors associated with resilience, such as coping skills, executive function, responsive and available parenting, and positive peer relationships, also may affect outcomes but were not assessed.

The present study advances a growing evidence base suggesting distinct etiological pathways for DTD and PTSD (DePierro et al., 2019). The findings affirm the well-established tie between PTSD and physical violence and traumatic loss, whereas DTD emerged as a candidate diagnosis for when attachment disruption occurs in children living in emotionally abusive and physically violent environments. Although these findings require replication in representative samples, they provide further evidence differentiating DTD and PTSD as separate diagnostic constructs. Although DTD and PTSD share many traumatic antecedents, the distinct traumatic antecedents associated with DTD can guide the adaptation of existing evidence-based treatments for childhood PTSD (Landolt et al., 2016) and the development of trauma-focused therapies for trauma-exposed and polyvictimized children and youth that complement but extend beyond the evidence-based therapies for childhood PTSD (Ford, Blaustein, et al., 2013). The DTD domains of biopsychosocial dysregulation and the developmentally attuned symptoms within each DTD domain provide clinicians with targets for assessment and treatment planning for children who do not meet the criteria for PTSD but have been adversely impacted by traumatic victimization and attachment disruption as well as for those with complex symptoms that include but extend beyond those related to PTSD.

## Open Practices Statement

The study reported in this article was not formally preregistered. Neither the data nor the materials have been made available on a permanent third-party archive; requests for the data or the Traumatic Events Screening Instrument (TESI) should be sent via email to the lead author at [jford@uchc.edu](mailto:jford@uchc.edu); requests for the Developmental Trauma Disorder Structured Interview (DTD-SI) should be sent via email to the second author at [josephspinazzola@foundationtrust.org](mailto:josephspinazzola@foundationtrust.org).

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