

PTEs, Trauma- and Stressor- Symptoms

Potentially Traumatic Events in Foster Youth, and Association with DSM-5 Trauma- and Stressor Related Symptoms

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Abstract

Background In DSM 5, three disorders are related to trauma and/or maltreatment: Post-traumatic Stress Disorder (PTSD), Reactive Attachment Disorder (RAD) and Disinhibited Social Engagement Disorder (DSED) but how these disorders relate to each other and to traumatic events is unknown. **Objective** We examined 1. Prevalence of Potentially Traumatic Events (PTEs) and poly-victimization for youths in foster care. 2. Associations between single/multiple PTEs and PTSD, DSED, and the two symptom-clusters that constitute RAD: *Failure to seek/accept comfort* (RAD A), and *Low social-emotional responsiveness/ emotion dysregulation* (RAD B). **Participants, setting and methods** Foster youth 11 to 17 years (N = 303) in Norway completed The Child and Adolescent Trauma Screen. Foster parents completed the RAD and DSED Assessment interview. **Results** Foster youth reported experiencing, on average, 3.44 PTEs each (range 0-15, *SD* 3.33), and 52.9 % reported PTSD symptoms at or above clinical cut off. The PTE sum score was associated with the latent factors PTSD ($r = .66, p < 0.001$), RAD cluster B symptoms (Low social-emotional responsiveness / emotion dysregulation, $r = .28, p < 0.001$) and DSED ($r = .11, p = 0.046$), but not with RAD cluster A symptoms (Failure to seek/accept comfort). **Conclusions** These findings raise new questions about the nature, mechanisms and timing of development of RAD and DSED. Maltreatment assessment needs to encompass a wide range of PTEs, and consider poly-victimization.

Keywords: Potentially traumatic events, PTSD, DSED, RAD, Foster youth

Introduction

Across countries, exposure to childhood adversities is reported by nearly a third of adults (Kessler et al., 2010) and the world-wide prevalence of childhood emotional abuse is estimated to be 36 % (Stoltenborgh, Bakermans-Kranenburg, Alink, & van Ijzendoorn, 2012). Child maltreatment may be divided into four main categories: physical abuse, sexual abuse, neglect and emotional abuse (Cicchetti & Toth, 2005), and constitutes a substantial risk factor for mental health problems across lifespan (Kessler et al., 2010). Exposure to childhood adversity, including abuse and neglect, has been estimated to account for 45% of mental disorders in childhood, hence is thought to be the single greatest predictor of mental health problems in children (Green et al., 2010). However, we lack evidence of risk-specificity across disorders (Vachon, Krueger, Rogosch, & Cicchetti, 2015). One explanation may be that children experiencing one form of maltreatment are, more often than not, exposed to several other forms of abuse and neglect: in diverse samples and different age ranges, a greater number of adversities increases the risk of mental disorders in a dose-response relationship. (Anda et al., 2006; Gilbert et al., 2009; Kessler et al., 2010; Kisely et al., 2018; Norman et al., 2012; Turner, Finkelhor, & Ormrod, 2006).

Children and young people placed in foster care are a particularly vulnerable group who have usually experienced abuse and neglect and have a high prevalence of mental disorders (Ford, Vostanis, Meltzer, & Goodman, 2007; Garland et al., 2001; Lehmann, Havik, Havik, & Heiervang, 2013). Prevalence estimates of mental disorders among young people in foster care are strikingly similar across western countries, where nearly 1 child or adolescent of every 2 meets criteria for a current mental disorder (Bronsard et al., 2016). On the other hand, knowledge about the prevalence of potentially traumatic experiences (PTEs) –and the links between PTEs and mental disorder among youth in foster care - is scarce in a European context. A review revealed a high but divergent prevalence rate (Oswald, Heil, & Goldbeck,

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2010). Across studies, neglect was reported most frequently (18-76%, followed by emotional abuse (8-77%), physical abuse (6-48%) and sexual abuse (4-35%). Only one of the included studies was from Europe (Minnis, Everett, Pelosi, Dunn, & Knapp, 2006), where reports of Neglect (75%), Physical abuse (39%) and Sexual abuse (28%) among 5-16 year old foster children were in the higher range. We need more European studies to validate whether these prevalence estimates are representative for foster children in Europe.

In the fifth version of the Diagnostic and Statistical Manual (DSM-5, American Psychiatric Association, 2013), trauma and/or maltreatment are explicitly linked to three disorders: Post-traumatic Stress Disorder (PTSD), Disinhibited Social Engagement Disorder (DSED) and Reactive Attachment Disorder (RAD). Although PTSD, unlike RAD and DSED, can also occur due to traumas that did not arise in the context of childhood abuse and neglect it has been shown to be strongly associated with substantiated emotional abuse and neglect among young adults (Kisely et al., 2018). Several retrospective studies have demonstrated a relationship between self-reported PTEs, poly-victimization, and PTSD (Kearney, Wechsler, Kaur, & Lemos-miller, 2010). While there is a growing body of empirical support for PTSD as a common sequela of maltreatment (Kearney et al., 2010), studies on possible overlap between RAD or DSED symptoms and PTSD symptoms are scarce (Boris & Zeanah, 2005).

The eleventh version of the International Classification of Diseases (ICD-11), released by the World Health Organization in 2018, distinguishes between PTSD and a new diagnostic category, Complex PTSD (CPTSD, (Brewin et al., 2017), which comprises both PTSD and Disturbances of self-regulation. CPTSD follows “*severe stressors of a prolonged nature, or multiple or repeated adverse events from which escape is difficult such as.....repeated childhood sexual or physical abuse*” (Reed et al., 2019). Hence, the etiology of CPTSD and DSM-5 RAD/DSED (experiences of extreme patterns of insufficient care) bear notable similarities. Symptoms of CPTSD (Affect dysregulation, negative self-concept,

disturbed relations) overlap with symptoms described in the DSM-5 criterion B for RAD: low social-emotional responsiveness / emotion dysregulation.

Until recently, assessment-tools compliant with the DSM-5 criteria for RAD and DSED have been lacking (Lehmann et al., 2018). The *RAD and DSED Assessment (RADA)*, Lehmann et al., 2018) interview is a revised version of the CAPA-RAD interview (Minnis et al., 2009). The revision had two main aims: first, to comply with the new criteria for RAD and DSED in DSM-5; second to enable assessment of RAD and DSED behavior in older age groups, including adolescents. For example, items assessing indiscriminate behavior now also encompass behavior toward peers. A validation study of the RADA indicated that whereas the data supported DSED as one construct, RAD may be divisible into two sub-factors (Lehmann et al., 2018). The first captures criteria A1 and A2: Failure to seek and accept comfort (RAD A), while the second factor comprises low social responsiveness/emotional dysregulation, in accordance with criteria B1, B2, B3 (RAD B). The three factors showed differential associations with clinical symptoms of emotional and social impairment, with RAD A (*Failure to seek or accept comfort*) standing out as uncorrelated to both DSED behavior and clinical symptoms of emotional and social impairment. RAD B (Low social-emotional responsiveness/ emotion dysregulation), on the other hand, was associated with both DSED behavior and clinical symptoms of emotional and social impairment (Lehmann et al., 2018). This finding led to the question of whether criterion B in the DSM-5 captures a more trauma-related than attachment-related phenomenon. Further, one might expect that exposure to maltreatment will also lead to symptoms of PTSD. In line with criteria for complex PTSD in ICD-11, prolonged exposure to PTEs in close relationships may lead to both PTSD symptoms and disturbances of self-regulation. Symptoms encompassed by DSM-5 criteria for RAD B (Low social-emotional responsiveness/emotion dysregulation) may therefore tap into the criteria of ICD-11 CPTSD.

RAD and DSED are assumed to stem from profoundly disturbed interactions between primary caregivers or lack of a stable available caregiver at an early stage of development and symptoms of RAD and DSED have now been demonstrated throughout and adolescence (Kay, Green, & Sharma, 2016; Lehmann et al., 2018; Minnis et al., 2013; Sonuga-Barke et al., 2017). In toddlers, symptoms of DSED are associated with early maltreatment (or maltreatment risk factors such as maternal drug use and psychiatric disorder) (Jonkman et al., 2014; Lalande et al., 2014; Lyons-Ruth, Bureau, Riley, & Atlas-Corbett, 2009; Zeanah et al., 2004). Yet in looked after adolescents a dose-response relationship has only been found between maltreatment and attention seeking, one of the DSED factors, but not with other RAD- or DSED behaviors (Kay & Green, 2013). Other studies have also been unable to demonstrate a clear association between maltreatment and DSED (Pears, Bruce, Fisher, & Kim, 2010; Scheper et al., 2019). Results are therefore inconclusive regarding the relationship between maltreatment and RAD/DSED symptoms. There could be methodological reasons for this. DSM-5 specifies that symptoms of RAD and DSED must be present before age 5 so, at least for some children, the foundations of disorders might stem from pre-verbal life stages and the etiological events/circumstances therefore might not easily be accessible through memories /self-recall.

Since PTSD, RAD and DSED, in maltreated children, are each assumed to arise from enduring and/or multiple damaging care conditions, one would expect an association between these dimensions. To the best of our knowledge, no study has so far simultaneously examined associations between PTEs and dimensions of DSED, RAD and PTSD in maltreated young people. Our hypothesis is that all PTEs are related to PTSD symptoms, whereas only the PTEs related to abuse/neglect are related to RAD and DSED. We also expect RAD B (Low social-emotional responsiveness/ emotion dysregulation) to be more closely associated with both PTEs and PTSD- symptoms than RAD A: (Failure to seek/accept comfort). Therefore, in this

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study, we examine the following questions: 1) What is the prevalence of PTEs and what is the extent of poly-victimization in a sample of young people in foster care in Norway? 2) Are there differential associations between PTEs that are specifically related to parental abuse and neglect on the one hand, and those unrelated to parenting on the other, with symptoms of PTSED and RAD/DSED respectively? 3) Is there a dose-response relation between increased numbers of PTEs and symptom load of PTSD, DSED and RAD?

Method

Procedure and study sample

The study sample is part of the ongoing research project in Norway; Young in Foster Care (Lehmann, 2015). Data was collected between 1st of October 2016 and 31st of March 2017. Eligible foster youth were born between 1999 and 2005 and had lived in their current foster home for at least six months following legally mandated placement. All were placed by municipalities in the five counties encompassed by The Office for Children, Youth and family Affairs– region south. Participants were assessed for eligibility from regional records (N = 573) and from the 43 municipal child protection services (CPS; N = 279) in the same region. The head of each office in the CPS was asked to provide background information for all eligible youths; in total 740 foster youth were identified as eligible.

Foster parents and youths were invited by postal mail to participate: An information letter describing the study, and how to complete the survey was enclosed. We invited all to complete the questionnaire separately either online or via telephone interview. In accordance with Norwegian legislation, we enclosed invitations to youths aged 11-15 years in the letter addressed to the carers, whereas youths aged 16 and older received their information letter directly. We sent reminders by post, and subsequently contacted the families by telephone to prompt participation. We compensated participating youths with a gift card of 33 USD. Foster parents did not receive compensation for participating.

Participants

The total sample ($N = 399$, 53.9 % response rate) consists of youths with survey completed either of foster parents ($n = 320$, 277 foster mothers, and 43 foster fathers; 43.2 % response rate) or foster youths (302, 41.9 % response rate). Of the responding youth, 223 (77%) also had a survey completed by foster parents. Due to skip-rules, only youth who answered Yes on at least one PTE item ($n = 247$), were invited to answer the items assessing PTSD symptoms. There were no single items missing within the different questionnaires.

The foster youth in this study ($N = 302$) were 11-17 years old ($M = 14.8$, $SD = 2.05$), 53% were male. They had lived in their current foster home for a mean duration of 6.7 years ($SD = 4.36$). Drop out analyses revealed no differences between participating youth ($n = 302$) and non-responders ($n = 438$) regarding gender or years in the foster home. Responders had a slightly higher mean age compared to non-responders (14.8 years vs 14.3 years, $p < .001$). Where both foster mother and –father had completed the RADA ($N = 73$), we found no significant differences in RADA mean score between foster fathers and foster mothers ($t = .92$, $df 72$, $p = .360$). Therefore, we used RADA completed from foster fathers when foster mothers had not responded.

Ethics

The Regional Committee for Medical and Health Research Ethics, Western Norway approved the study. The Norwegian Directorate for Children, Youth and Family Affairs provided exemptions from confidentiality for caseworkers and foster parents. In accordance with Norwegian Ethics requirement, oral assent is required from children aged 12 years or older. We informed all the youths in the invitation letters that they could inform their foster parents if they did not want their foster parents to participate in the study.

Measures

The Reactive Attachment Disorder and Disinhibited Social Engagement Disorder Assessment (RADA) interview (Lehmann et al., 2018) is an assessment tool compatible with the DSM-5 criteria for symptoms of RAD (11 items) and DSED (9 items). The RADA is currently available in English, French and Norwegian. The RADA may be administered as an online questionnaire completed by the caregiver or be administered as a face-to-face semi-structured interview. Answers on each item are coded on a 3-point scale as No (=0), A little (= 1), A lot (= 2), yielding a scale score range of 0 to 22 for the RAD scale and 0 to 18 for the DSED scale.

The first examination of the RADA, as completed by foster parents, identified a good fit for a three-factor model (Lehmann et al., 2018). One factor comprises the 9 DSED items (indiscriminate behaviors with strangers) and two factors comprising RAD items (RAD A: two items comprising Failure to seek/accept comfort, and RAD B: 9 items comprising Low social-emotional responsiveness/emotion dysregulation). However, one item originally designed to correspond to RAD criteria B (item 16, *Difficulties being affectionate*), showed low factor loading on RAD B, and high cross loading with RAD A (.64, Lehmann et al., 2018). Therefore, in the current analyses, item 16 *Difficulties being affectionate*, was grouped together with the two items comprising RAD A; *Failure to seek/accept comfort*. For detailed description of the items and the factor structure of the RADA, see Lehmann et al., 2018.

Potentially traumatic events (PTE) and symptoms of post-traumatic stress disorder (PTSD). In this study, we used the Norwegian version of The Child and Adolescent Trauma Screen (CATS) (Sachser et al., 2017), translated by the Norwegian Centre for Violence and Traumatic Stress studies. The CATS is a questionnaire with two parts. Part 1 assess 15 different forms of PTEs young people may experience both outside of and within a family context, as defined in the DSM-5. The questionnaire introduces the list of PTEs with the following instruction: “*Below is a list of events children and young people may*

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experience. If it happened to you, and you felt scared, confused or helpless, then mark Yes. If there are any questions you do not want to answer, mark Pass". CATS does not cover emotional abuse and neglect. We therefore added three items based on items 1, 4 and 5 in the ACE questionnaire (Felitti et al., 1998) covering emotional neglect: "*Often felt that your family did not love you –or that your family did not take care of you or each other*"; physical neglect: "*Often felt that you did not have enough to eat, or you had to wear dirty clothes*"; and emotional abuse: "*Ever experienced a parent or other grown up in your home sworn at, offended, threatened, ridiculed, or being hurtful towards you*". Two custom - made items assess parentification due to neglect: "*Often cared for your own parents because they were unable to take care of themselves*" and "*Often cared for your siblings because your parents were unable to*". Together, these five items replaced two original items "*Serious natural disaster like a flood, tornado, hurricane, earthquake or fire*"; and "*Ever experienced very scary events at the doctor, dentist or at hospital*". Table 2 show all 18 items used in this study. The PTE part is scored 0 (*No*), or 1 (*Yes*). We used this coding in univariate correlation analyses where we combined PTE items into a scale. Respondents also had the option to answer *Pass*. To examine prevalence of PTEs, we computed variables for all single PTE items, where *Pass* responses were set as missing.

Part 2 of the CATS comprises 20 items covering symptoms of PTSD and is based on the DSM-5 criteria. Accordingly, items cover the following core symptoms of PTSD: intrusions, avoidance, negative alterations in cognition and mood, and hyper-arousal. The PTSD part is scored Never (=0), Once in a while (=1), Half of the time (=2) and Almost always (=3), yielding a sum score range from 0 to 60. The CATS has demonstrated satisfactory psychometric properties in samples of trauma-exposed children in the US, Germany and Norway (Sachser et al., 2017). For part 2 of the CATS, a confirmatory four-factor solution based on the DSM-5 definition of PTSD (Sachser et al., 2017) had a good fit to

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our data ($\chi^2 = 28679.904$, $df = 190$, $p < 0.001$, CFI = 1.00, TLI = 1.00, RMSEA 0.00, 90 % Confidence Interval [CI] [0.00, 0.00]). In accordance with Sachser et al (2017), the factor correlations were very large. In our sample, three factors had intercorrelations $\geq .85$ suggesting lack of discriminative validity (Brown, 2015), as they seem to be highly influenced by the same construct. We therefore conducted a confirmatory factor analysis for an alternative model with all 20 items comprising one PTSD factor. This model also yielded good fit with our data ($\chi^2 = 8112.237$, $df = 190$, $p < 0.001$, CFI = 0.99, TLI = 0.99, RMSEA 0.04, 90 % Confidence Interval [CI] [0.02, 0.05]). In further analyses, we use the one-factor solution as a measure of PTSD as a single construct.

Statistical Analyses

We conducted descriptive analyses in IBM SPSS Statistics version 22. Confirmatory factor analyses and correlations between single items measuring exposure to PTEs on one side, and the latent factors PTSD, DSED, RAD A (Failure to seek/accept comfort), and RAD B (Low social-emotional responsiveness / emotion dysregulation) on the other side, was conducted using Mplus version 8.0 (Muthén & Muthén, 2012). We used an estimator which took the categorical nature into account (WLSMV estimator). Our main model, with the four latent factors PTSD (20 items); RAD A (3 items); RAD B (8 items); and DSED (9 items), yielded good fit with our data ($\chi^2 = 915.362$, $df = 734$, $p < 0.001$, CFI = 0.99, RMSEA = 0.029 (90% CI = .022–.035)).

Missing data were handled by pairwise deletion, which is the default method when using this particular estimator. Due to skip rules in the survey, only youth answering *Yes* to any of the part one (PTE items), were given the option to complete part two of the CATS, assessing PTSD symptoms. Therefore, for youth respondents ($n = 38$) who had answered *No* on all 18 PTE items (including the open-ended question “*Experienced anything else that made*

you feel confused or helpless”), all PTSD item were coded zero. For respondents answering *Pass* to all 17 PTE items ($n = 20$), all PTSD item were coded missing.

Results

Prevalence of PTEs and polyvictimization

As can be seen in table 1, the youths had experienced up to 15 potentially traumatic events (PTE sum score range 0-15, $M = 3.44$, $SD = 3.34$). Also, Table 2 shows that the most frequent PTEs were experiences of serious injury, sickness or sudden death of loved ones (54%). Next, any emotional or physical abuse (36.8 %); exposure to any neglect (36.0%); experience of being hit, kicked, pulled, injured or threatened by someone outside family (25.5%) and any experience of sexual abuse (24.3 %).

Association between PTEs and PTSD, RAD A, RAD B and DSED

Symptom scores for PTSD ranged from 0-57 ($M = 12.68$, $SD = 13.76$). Girls reported significantly more PTSD symptoms ($M = 16.96$, $SD = 15.63$) than did boys ($M = 8.93$, $SD = 10.63$, $t = -5.55$, $df = 297$, $p < 0.001$). Overall, 52.9 % of the youth reported PTSD symptoms at or above the clinical cut off score of 15, signifying “*Moderate trauma related stress*” to “*likely PTSD*”. The mean PTSD total symptom score in our sample were somewhat lower than what has been found among children receiving services in out-patient mental health clinics in Norway (Sachser et al., 2017) ($M = 20.68$, $SD = 14.09$, $t = -3.262$, 95 % CI [-8.4419 -2.0781], $df 199.7$, $p < 0.001$).

Table 1 in here

Table 2 in here

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Of the 18 PTE items, 16 were associated with the PTSD factor. The exception was “*Ever been involved in a serious accident*”, and “*Ever experienced terror or war*”. The association between PTSD and four PTEs: “*a parent or other grown up in your home swore at, offended, threatened, ridiculed, or being hurtful towards you*”; “*cared for your own parents because they were unable to themselves*”; “*felt that your family did not love you/take care of you or each other*”; and “*experienced anything else that made you feel confused or helpless*”, yielded large effect sizes ($r \geq .5$). Nine of the PTEs were associated with RAD B (Low social-emotional responsiveness/emotion dysregulation), but with altogether smaller effect sizes ($r \leq .3$). The strongest association was found for the item “*felt that your family did not love you/take care of you or each other*”. Results are displayed in Table 3.

Table 3 in here

Dose-response relationship relation between increased numbers of PTEs and symptom load of PTSD, DSED and RAD

The PTE sum score was associated with the latent factors PTSD ($r = .66, p < 0.001$), RAD B (Low social-emotional responsiveness / emotion dysregulation, $r = .28, p < 0.001$) and DSED ($r = .11, p = 0.046$), but not with RAD A (Failure to seek/accept comfort). The PTSD dimension was associated with RAD B ($r = .31, p < 0.001$) and DSED ($r = .19, p < 0.028$). Table 4 shows correlations between the latent dimensions PTSD, RAD A, RAD B, and DSED.

Table 4 in here

Discussion

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This study examined the prevalence of self-reported potentially traumatic events in a sample of maltreated young people in foster care. Not surprisingly, more than eighty percent of the youth reported exposure to at least one PTE. The exposure to neglect, violence and sexual abuse is three to four times higher among these young people in foster care, compared to the prevalence of self-reported PTEs in a Norwegian community sample (Myhre, Thoresen, & Hjemdal, 2015). In that community sample, 9.6 % of 16-17 year olds reported exposure to physical violence and 6.6 % reported psychological violence from their parents (Myhre et al., 2015). Further, neglect was reported by 8.5 %, while 13.5 % of the girls and 3.7 % of the boys reported being subjected to sexual abuse.

The strong associations between number of PTEs and PTSD symptoms mirrors general population findings (Kisely et al., 2018). However, according to our findings, foster youth report somewhat lower levels of PTSD symptoms than clinical samples (Sachser et al., 2017). Still, over half of the foster youth scored at or above clinical cut-off, indicating a need for assessment and interventions in this group especially targeting PTSD symptoms.

To the best of our knowledge, this is the first paper to separately examine the two clusters of symptoms comprising RAD; the attachment-related RAD cluster A (Failure to seek/accept comfort and difficulties being affectionate) criteria, and RAD cluster B (Low social-emotional responsiveness/emotion dysregulation). While PTSD and RAD cluster B (Low social-emotional responsiveness / emotion dysregulation) are both associated with self-reported interpersonal potentially traumatic events in our study, these two constructs seem to be different expressions of trauma-sequelae since the correlation between these two symptom clusters was moderate. In other words, our findings support the construct validity of RAD as there seems to be a RAD sub-dimension (cluster B) related to, but separate from, the PTSD dimension.

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Like the PTSD dimension, RAD cluster B (Low social-emotional responsiveness / emotion dysregulation) showed associations with both single and multiple potentially traumatic events in our sample. This finding strengthens our notion that RAD cluster B symptoms in DSM-5 could measure trauma-related, rather than attachment-related, symptomatology. Our finding mirrors findings from a recent study of adult survivors of child abuse and neglect, showing associations between self-reported maltreatment-experiences, and symptoms of difficulties with emotional regulation (Knefel, Lueger-Schuster, Karatzias, Shevlin, & Hyland, 2018).

In contrast with symptoms of PTSD and RAD cluster B (Low social-emotional responsiveness and emotion dysregulation), DSED and RAD cluster A (Failure to seek/accept comfort and difficulties being affectionate) were not associated with potentially traumatic experiences self-reported in the teenage years. Yet symptoms of DSED and RAD have *only* been described in maltreated or institutionalized children (Gleason et al., 2011) and DSM-5 specifies that RAD and DSED are caused by “extreme of insufficient care” occurring before age 5. This has led us to speculate that the environmental causes of RAD and DSED might mostly occur in the pre-verbal/pre-memory stage. That is, it is possible that children with RAD cluster A symptoms and DSED symptoms who do not report a PTE may simply not be able to report PTEs because of the childhood amnesia phenomenon (not being able to remember events if they occurred before the age of 2 or 3).

The mechanisms of development of RAD and DSED – and the reasons why some abused and neglected children develop RAD or DSED while some do not – are still poorly understood. A process of “biological programming” during a sensitive period of early development has been postulated (Rutter & O'Connor, 2004) and three pieces of evidence lend support to this. Firstly, in the European- Romanian Adoption Study, symptoms of DSED were around half as common in children who had experienced severe institutional deprivation

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for less than 18 months compared to those who experienced this for 24-42 months. DSED symptoms were relatively stable after 4 years of age and were not associated with head circumference, nutritional status or cognitive level (Rutter & O'Connor, 2004). Secondly, despite RAD and DSED only arising in the context of early maltreatment or early institutionalization, both have been shown to be strongly heritable (Minnis et al., 2007). Genetic/temperamental determinants of vulnerability to RAD and DSED (in the context of maltreatment) are therefore likely to be present at birth. Thirdly, maltreated children are at much higher risk than their peers of having neurodevelopmental disorders such as Attention-deficit/Hyperactivity Disorder and Intellectual Disabilities, that do not appear to be caused by the maltreatment (Dinkler et al., 2017; Minnis et al., 2007), and which pre-date the maltreatment in the lifecycle (Danese et al., 2016; Stern et al., 2018). It may be that neurodevelopmentally vulnerable children are at greater risk of developing RAD and/or DSED during early life if family relationship functioning is poor. If RAD and DSED do emerge at this very early stage of development, when the parent-infant relationship is at its most crucial, then deficits largely based in the domains of relationship functioning make sense. Hence, we need research on targeted interventions focusing on relational functioning, based on an understanding of relational and emotion-regulation deficits as rooted in early vulnerability and/or adverse experiences in primary relations. If offered early in life, these interventions could promote improved health care to children at high risk of burdensome problems later in life.

The previous literature showing that survivors of abuse and neglect can demonstrate symptoms of both PTSD and emotional-regulation/relationship difficulties (Knefel, Lueger-Schuster, Karatzias, Shevlin, & Hyland, 2018) has prompted calls for these symptoms to be pulled together into one diagnosis, namely “Developmental Trauma Disorder” (Van der Kolk, 2017). We would argue that our findings suggest that the complex problems of abuse/neglect

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survivors are likely to encompass separate syndromes that have probably arisen from different types of adversity at different times in the life-course. Most importantly, treatments for DSED, RAD and PTSD are likely to differ and abuse/neglect survivors may require more than one treatment modality.

A strength of this study is that we examined RAD and DSED behavior as well as PTSD symptoms with use of newly validated assessment tools that allow for assessment based on the complete set of DSM-5 criteria for RAD, DSED and PTSD. The use of self-report of PTSD symptoms addresses the problems of using parent-reports for subjective, internal symptoms not easily detected by caregivers like intrusion, re-experiencing, and avoidance. Further, this study assesses a wide range of potentially traumatic events, carefully addressing the need for broad measures of maltreatment experiences including emotional abuse and neglect. However, there are several limitations to this study. Our sample is relatively large but, as it is challenging to recruit young people in foster care, our consent-rate is lower than we would have wished for. The assessment of potentially traumatic events does not cover information on when an event first occurred, frequency of events, severity of events or details on the relationship with the perpetrator. Self-report from young people may give an under –or over- estimate of exposure, due to recall-bias. It would have been helpful to have included reports of events from social care records, but these were not available to us. Also, minor events (e.g. poor parenting) and severe maltreatment have the same weight on each item. The association between exposure to PTEs and PTSD-symptoms may have been inflated or reduced due to use of self-report for both. Further, self-selection bias cannot be ruled out. The survey was extensive, time consuming, and could possibly be too demanding for the most impaired youth. Still, we found that the attrition was very low, so that among those starting to complete the survey, almost all completed it. Further, great care was taken to balance the focus on strengths and resources against problems and impairment in the information letter.

Our findings indicate that young people in foster care are exposed to multiple types of interpersonal traumas and that these experiences increases the risk of both well-established PTSD-symptoms and symptoms of Low social-emotional responsiveness/emotional dysregulation as defined by RAD criteria B in DSM-5. There are clinical implications to be drawn from our findings: Children, adolescents or adults with a history of child maltreatment need careful assessments that take into account relationship-focused problems as well as trauma-related problems. For preschool and school aged children and adolescents, there are several measures available, depending on the aim and competency of the assessor. The Relationship Problems Questionnaire (RPQ) (Minnis, Rabe-Hesketh, & Wolkind, 2002) is an 18-item brief screening measure of RAD and DSED symptoms, which may be administered to carers or teachers (RPQ-T). The RPQ shows satisfactory psychometric properties both completed by teachers (Kay et al., 2016), and carers (Minnis et al., 2013; Minnis et al., 2007)). Another possible conclusion to be drawn from our findings is that young people with RAD A and DSED symptoms do not report PTE to the same extent as youth with PTSD and RAD B symptoms. So in clinical practice and in research, maltreatment history should also be obtained from independent sources, such as the child protective service or close family members. This is especially important in clinical practice for diagnostic purposes, because adverse early care experiences is a criterion that needs to be met to diagnose RAD and DSED. Clinicians may need to allow time to establish rapport and preferably seek information from other people close to the child (i.e. teacher, close relatives), before concluding on the absence or presence of maltreatment in the child's history. Further, those with a history of child maltreatment may well have problems in the domains of DSED, and PTSD, and may require a range of different treatments. Recent practice parameters (Zeanah et al., 2016) suggest that, in the absence of validated program/intervention for RAD and DSED (except from placement out of the neglecting environment), ensuring emotional availability from an attachment figure

is recommended. The parameter recommends psychotherapeutic modalities that work through the caregiver, and with the caregiver-child relation. Evidence-based interventions to improve relationship functioning (such as Video Interaction to Promote Positive Parenting (Shah, Kennedy, Clark, Bauer, & Schwartz, 2016), Attachment and Biobehavioural Catch-up (Dozier & Bernard, 2017) or Child-Parent Psychotherapy (Lieberman, Ippen, & Van Horn, 2006)) should be available as treatment options. Because it has been demonstrated that maltreated children are more likely to also have neurodevelopmental problems, treatment/management strategies for ADHD, ASD and other problems might be required alongside these relational treatments.

More research is needed about the causes and mechanisms of the development of RAD and DSED. This will need large samples of abused and neglected children followed prospectively and with meticulous characterization of the postnatal and, ideally, prenatal environment.

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Table 1.

Demographic characteristics, exposure to Possible Traumatic Events (PTEs) and prevalence of Post-Traumatic Stress Disorder (PTSD) symptoms

	Mean	SD	N	%
Age, Years	14.8	2.05		
Years Lived in current foster home	6.7	4.34		
Gender, boys			161	53.0%
Number of PTEs	3.44	3.34		
0			55	18.2
1			62	20.5
2			40	13.2
3-4			53	17.5
5-6			35	11.6
7-8			26	8.6
9+			31	10.3
Number of PTSD Symptoms*	15.42	13.82		
Moderate trauma related stress, 15-20			32	13.1
Probable PTSD, 21-57			73	39.8

Note. *N = 247: Includes informants who answered yes to at least one PTE item only.

Table 2

Frequency of possible traumatic experiences as reported by youth (N =302)

Have you	Yes		Pass	
	N	%	N	%
Ever been involved in a serious accident	41	13.6	11	3.6
Ever experienced terror or war	3	1.0	5	1.7
Ever experienced serious injury, sickness or sudden death of loved ones	163	54.0	18	6.0
Ever experienced bullying or threats	73	24.3	19	6.3
Ever experienced abduction/kidnapping	19	6.3	7	2.3
Ever ben hit, kicked, pulled, injured or threatened by someone outside family	77	25.5	22	7.3
Ever witnessed others outside family being hit, kicked, pulled, injured, threatened or attack each other	111	36.8	16	5.3
Any Abuse	111	36.8		
Ever witnessed parents or other grown up in your home being hit, kicked, pulled, injured, threatened or attack each other	49	16.2	13	4.3
Ever been hit, kicked, pulled, injured or threatened by a parent or other grown up in your home	56	18.5	8	2.6
Ever experienced a parent or other grown up in your home swore at, offended, threatened, ridiculed, or being hurtful towards you	74	24.5	14	4.6
Any Neglect	108	36.0		
Often cared for your own parents because they were unable themselves	46	15.2	20	6.6
Often felt that your family did not love you –or that your family did not take care of you or each other	72	23.8	16	5.3
Often felt that you did not have enough to eat, or you had to wear dirty clothes	49	16.2	12	4.0
Often cared for your siblings because your parents were unable to	46	15.2	12	4.0

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Any Sexual abuse	73	24.2		
Ever someone taken pictures of your private body parts	19	6.3	16	5.3
Ever experienced someone touching, or yourself being forced to touch others private body parts	39	13.0	16	5.3
Ever experienced rape (anal, oral, or vaginal)	20	6.6	11	3.6
Experienced anything else that made you feel confused or helpless	83	27.5	41	13.6

Table 3

Correlations between single Possible Traumatic Events-items and dimensions of Disinhibited Social Engagement Disorder (DSED), Reactive Attachment Disorder; Failure to seek/accept comfort (RAD A); Low social-emotional responsiveness / emotion dysregulation (RAD B) and Post-Traumatic Stress Disorder (PTSD)

Have you	DSED <i>r</i>	RAD A <i>r</i>	RAD B <i>r</i>	PTSD <i>r</i>
Ever been involved in a serious accident	.13	.18*	.15*	.08
Ever experienced terror or war	.02	-.01	-.06	.02
Ever experienced serious injury, sickness or sudden death of loved ones	.02	.02	.09	.29***
Ever experienced bullying or threats	.14	-.03	.22**	.43***
Ever experienced abduction/kidnapping	.03	.03	.14	.22***
Ever been hit, kicked, pulled, injured or threatened by someone outside family	.12	.05	.21**	.39***
Ever witnessed others outside family being hit, kicked, pulled, injured, threatened or attack each other	.05	.01	.17*	.41***
Ever witnessed parents or other grown up in your home being hit, kicked, pulled, injured, threatened or attack each other	.06	-.05	.08	.30***
Ever been hit, kicked, pulled, injured or threatened by a parent or other grown up in your home	.08	.02	.18*	.33***
Ever experienced a parent or other grown up in your home swore at, offended, threatened, ridiculed, or being hurtful towards you	.08	.03	.16*	.51***
Often cared for your own parents because they were unable themselves	.07	.03	.16	.49**
Often felt that your family did not love you – or that your family did not take care of you or each other	.13	-.04	.29***	.52***

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Often cared for your siblings because your parents were unable to	.16*	.01	.22**	.33***
Often felt that you did not have enough to eat, or you had to wear dirty clothes?	.08	.00	.18*	.29**
Ever someone taken pictures of your private body parts	.01	.14	.16*	.28***
Ever experienced someone touching, or yourself being forced to touch others private body parts	.01	-.01	.08	.40***
Ever experienced rape (anal, oral, or vaginal)	.11	.12	.04	.30***
Experienced anything else that made you feel confused or helpless	.14	-.10	.22**	.52***

Note. * $\leq .05$; ** $\leq .01$; *** $\leq .001$

Table 4

Correlations between Possible Traumatic Events (PTE)-sum score, dimensions of Disinhibited Social Engagement Disorder (DSED), Reactive Attachment Disorder; Failure to seek/accept comfort (RAD A); Low social-emotional responsiveness / emotion dysregulation (RAD B) and Post-Traumatic Stress Disorder (PTSD)

	PTE sum score	PTSD	DSED	RAD A	RAD B
PTE sum score	1				
PTSD	.66***	1			
DSED	.11*	.19*	1		
RAD A	.04	.09	.06	1	
RAD B	.28***	.31***	.61***	.24***	1