Title: On the complex and dimensional relationship of maternal PTSD during early childhood and child outcomes at school-age.

Authors:

Dominik Andreas Moser PhD [1,2*], Shannen Graf MS [1], Jennifer Glaus PhD[1], Sébastien Urben PhD[1], Sondes Jouabli MS[1,3], Virginie Pointet Perrizolo PhD[3], Francesca Suardi PhD[4], JoAnn Robinson PhD[5], Sandra Rusconi Serpa MS[4], Kerstin Jessica Plessen PhD[1,6], Daniel Scott Schechter PhD[1,3,6,7]

1 Lausanne University Hospital, Child and Adolescent Psychiatry Service, Lausanne Switzerland

2 University of Bern Institute of Psychology, Bern, Switzerland

3 University of Geneva Faculty of Medicine, Geneva, Switzerland

4 University of Geneva Faculty of Psychology and Educational Sciences, Geneva, Switzerland

5 Department of Human Development and Family Sciences, University of Connecticut-Storrs, USA

6 Faculty of Biology and Medicine, University of Lausanne

7 Department of Child and Adolescent Psychiatry, New York University Grossman School of Medicine, USA

***Corresponding Author:** Dominik Moser, Child and Adolescent Psychiatry Service of CHUV, Avenue d'Echhalens 9, 1004 Lausanne, Switzerland, email: domamoser@gmail.com

Keywords

Post-Traumatic Stress Disorder, Intergenerational psychopathology, Violence, Parenting

Abbreviations

ADHD: Attention-Deficit/Hyperactivity Disorder, BDI: Beck Depression Inventory, CBCL: Child Behavior Checklist, CAPS: Clinician Administered PTSD, IPV: Interpersonal Violence, PTSD: Post Traumatic Stress Disorder, PSI: Parenting Stress Index, sCCA: sparse canonical correlation analysis, SES: socio-economic status, PRF: parental reflective functioning, MSSB: MacArthur Story Stem Battery, PCL-S: Posttraumatic stress disorder Checklist Scale, TAS20: Toronto Alexithymia Scale.

This peer-reviewed article has been accepted for publication but not yet copyedited or typeset, and so may be subject to change during the production process. The article is considered published and may be cited using its DOI.

This is an Open Access article, distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives licence (http://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is unaltered and is properly cited. The written permission of Cambridge University Press must be obtained for commercial re-use or in order to create a derivative work.

source: https://doi.org/10.48350/178349 | downloaded: 7.5.2024

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Abstract

Background: Several studies have shown associations between maternal interpersonal violence-related posttraumatic stress disorder (PTSD), child mental health problems and impaired socioemotional development. However, the existing literature lacks evidence linking constellations of risk-factors such as maternal interpersonal-violence related PTSD, psychopathology, and interactive behavior with toddlers and outcome measures at school-age. **Methods:** The present study involved a prospective, longitudinal investigation of 62 mothers and examined the relationship between maternal variables measured when children were in early childhood (mean age 27 months), and child outcomes when children were school-age (age mean = 83.2 months), while retaining a focus on the context of maternal PTSD. To identify and weigh associated dimensions comparatively, we employed sparse canonical correlation analysis (sCCA) aimed at associating dimensions of a dataset of 20 maternal variables in early childhood with that of more than 20 child outcome variables (i.e., child psychopathology, life-events, and socio-emotional skills) at school-age. **Results:** Phase 1 variables with the highest weights were those of maternal psychopathology: PTSD, depressive and dissociative symptoms, and self-report of parental stress. The highest weighted Phase 2 child outcome measures were those of child psychopathology: PTSD, anxiety and depressive symptoms as well as peer bullying and victimization. **Conclusions:** sCCA revealed that trauma related concepts in mothers were significantly and reliably associated with child psychopathology and other indicators of risk for intergenerational transmission of violence and victimization. The results highlight the dimensional and multi-faceted nature - both for mothers as well as children - of the inter-generational transmission of violence and associated psychopathology.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Introduction

Parenting is a complex task, with many challenges along the way that necessitate self-regulation of emotion and arousal to assist the child with his development of self-regulation, social communication, and to limit and redirect normative hostile aggression during this sensitive developmental period in early childhood (i.e., mutual regulation, 1). This parental function relies in part on the ability to infer mental states in self and in one's child (i.e., mentalization, 2). A multitude of factors, such as parents' psychopathology, a history of exposure to interpersonal violence (IPV), including child physical and/or sexual abuse, not to mention daily life stresses may interfere with a parent's capacity to participate in the mutual regulation of emotion and arousal. Outcomes for children of parents, whose psychological impairment and/or distress preclude(s) their effective participation in mutual regulation during this early period, can include various forms of behavioral difficulties and psychopathology, which in turn may interfere with learning and socialization, impaired development of social cognition, as well as altered mental representations of human relationships, both for themselves and their caregivers (3-5).

The link between PTSD and commonly comorbid conditions has been thoroughly studied in recent decades. About 80% of women and almost 90% of men with PTSD have at least one other psychiatric diagnosis, about half of them (44% of women and 59% of men) having three or more(6). The most common forms of other psychopathology associated with PTSD are substance abuse and affective disorders (e.g., depression, dysthymia, 6, 7). Parental PTSD has been shown to increase parenting stress and reduce maternal sensitivity (i.e., the capacity to understand and respond appropriately to the child's attachment signals, 8). Additionally, PTSD in the context of increased childhood adversity (i.e., early abuse and violence exposure) is also associated with lower parental reflective functioning, i.e., as a measure of mentalization which is the parent's ability to infer the child's thoughts, feelings and mental states (8). PTSD resulting from childhood adversity associates also with symptoms of alexithymia (i.e., the difficulty in identifying and naming one's own and others' emotions, 9, 10).

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

These relationships are complicated by the fact that many of these factors are associated with one another, such as the various forms of trauma-related psychopathology, as well as measures of alexithymia, socio-economic status (SES), parental reflective functioning (PRF) and maternal sensitivity (6, 11-14) which have multiple interrelations. The same is true for child outcomes: different factors show a complex pattern of univariate associations with each other. Different forms of child psychopathology are associated with each other (15), can be linked to child mental representations of relationships (16, 17), social behaviors and aggression (18) and child temperament (19). While examining each of these factors individually is undoubtedly useful, this complex pattern of relationships suggests that a multivariate dimensional approach may be necessary to capture and then interpret the overall data and to quantify the individual impact of different measures.

The aim of the present study was therefore to investigate the prospective longitudinal associations of maternal measures when children were toddlers, with child outcomes when children were 5-9 years old. The sample consisted of about 2/3 mothers with a history of PTSD in the context of a history of childhood physical abuse, domestic violence exposure, and adult domestic and other violent victimization. Apart from violence-related measures, maternal measures also focused on mothers' capacity to interact with and understand their child. For children, we wanted to examine potentially less debilitating but generally applicable outcomes, such as emotional comprehension, children's representations of their parent(s) and relationship with their parent(s), as well as maternal report of child temperament, and bullying and victimization by bullies. Finally, we were also particularly interested in continuous measures of child psychopathology as marked by number of symptoms on a structured clinical interview of the child and parent. In order to incorporate such diverse outcomes, we used a multi-variate analysis approach called sparse Canonical Correlation Analysis (sCCA, see methods). sCCA investigates associations of entire datasets (as opposed to - for example - multiple regression analysis which investigates associations of multiple variables with only one outcome variable). In this case we used it to associate maternal and demographic measures

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

when children were 1-3.5 years old with a dataset of child outcomes when children were school-age (5-9 years old). Importantly sCCA allows for quantification of the importance of different variables in concert (i.e. variables of the same dataset are not necessarily weighed down because they explain overlapping variance as is the case in multiple regression). This was partially because while negative outcomes for children of mothers with pathology seem likely, how their weights affect different developmental stages (such as school-age here) is largely unknown. A central reason for using sCCA was to allow a theory agnostic statistical approach, that does not force a focus on a single relationship between the datasets but rather allows the algorithm to drive how the datasets are best associated.

We hypothesized that maternal psychopathology, and the quality of maternal interactive behavior would be related to child psychopathological symptoms and maladaptive behaviors.

More specifically among these behaviors, we hypothesized that maternal IPV-PTSD affecting the mother-child relationship as manifested by decreased maternal sensitivity during formative development of emotion regulation at ages 1-3,5 years would predict child peer-directed bullying and being bullied at school-ages 5-9 years as possibly a further predictor of intergenerational risk for perpetration of IVP vs IVP victimization.

Methods

Study procedure and sample

We obtained approval from the Geneva University Hospitals' institutional ethics committee (14-271). The study was conducted in accordance with the Helsinki Declaration. Mothers gave informed consent for themselves and their children. The project is longitudinal in nature, wherefore this study refers to Phase 1, at which children (56% boys) were 1 to 3.5 years of age (mean = 27 months, SD = 8.6), and Phase 2, at which children were 5 to 9 years old (mean = 84 months, SD = 12.9). This period is associated with the formation of self-regulation of emotion and the acquisition of rudimentary mentalization (i.e. reflective functioning) (20-22).

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Mother-child dyads were excluded: (1) If mothers self-reported actively abusing substances; (2) suffered from a psychotic disorder; or (3) if mother or child were otherwise physically and/or mentally unable to participate in the tasks.

At Phase 2, participants were included when children were ages 5-9 years-old. After collecting informed consent, 64 mother-child dyads participated in Phase 2 of the Geneva Early Childhood Stress Study (76% retention). Two dyads were excluded due to more than 20% of data missing. Among the remaining 62 dyads, 40 mothers had experienced significant PTSD symptoms during their lifetime (CAPS score >= 40; age mean = 39.3, SD = 5.8; 55% boys; children's age mean = 83.2 months, SD = 13.7). Twenty-two mothers had not (age mean = 40.5, SD = 5.3; 59% boys; children's age mean = 85.4 months, SD = 11.5, see Table 1). For more on recruitment, exclusion criteria and additional sample information, see Supplement.

Data collection and measures

Phase 1. Twenty-one measures from Phase 1 were included in the analysis (see table 2A for description of measures). Nineteen of them included data on maternal psychopathology (5 measures), experienced abuse during childhood (3 measures) as well as parental behaviors, skills and tendencies (11 measures).

Additionally, SES and child sex were included, using the Geneva Sociodemographic Questionnaire(23). While these were not predictors of interest, this approach allowed us to quantify their impact on results compared to other measures rather than having to regress out their effect and thereby altering the data set. We wanted to avoid the latter, as these factors are known to be related to some of the other input or outcome measures.

Phase 2. Twenty-five measures were included (19 in analysis 1), as shown in Table 2B. These included number of child psychopathology symptoms (5 measures),as well as measures of child exposure to criminal and traumatic events, bullying (2 measures), emotion comprehension (3

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

151 measures) and MacArthur Story Stem Battery (MSSB, 24) assessed children's representations of their
152 parents and their emotions (8 measures).

153 Furthermore, for analysis 2, maternal report on internalizing and externalizing symptoms in children
154 and 4 measures concerned with child temperament were added. All measures were validated and
155 possess good to very good psychometrics (Table 2).

156 Data analysis

157 To incorporate the diverse outcomes and measures described above, we used (sparse) canonical
158 correlation analysis (sCCA, 25, 26), which allows for data-driven quantification of the importance of
159 included variables and a better understanding of the inter-association of complex datasets in a
160 dimensional way beyond what is possible with usual univariate approaches.

161 We then performed sCCAs to investigate the association of Phase 1 data on mothers (and potential
162 confounders) with child relevant data from Phase 2. Briefly, the sCCA algorithm assigns weights to
163 each variable such that when multiplied with participant scores on those variables, a variate for each
164 dataset is created, which represents this dataset. These variates are then correlated. Using an L1-
165 norm penalty sCCA also allows to reduce the weights of variables to 0 with the goal to reduce the
166 impact of potentially spurious associations. Within the given parameters, sCCA is designed to assign
167 weights in such a way that the correlation of such variates is maximized. The weights of the variables
168 could be interpreted as representing their importance to the model and usually indicate that the
169 variable is associated with the variate of the other dataset. More specifically, a high weight for a
170 variable of the phase 1 dataset indicates that the model assigns it high importance for predicting the
171 selected outcomes of the phase 2 dataset (as represented in the variate of that data set). The P-
172 value represents the fraction of the 10'000 permutations of the data that showed a higher
173 correlation than the original data. For further information on how sCCA was applied here -including
174 L1-norm- penalties see the supplement.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Because maternal report of their children's psychopathology could potentially be affected by mothers' own biases linked to her psychopathology, personality, and interpersonal skills, we first performed an analysis in which maternal factors at Phase 1 were associated exclusively with child outcome measures that were self-reported by children or administered by clinicians. However, because parents often provide insights into their children's symptoms and behaviors that their children may not otherwise report(27), we decided in a second step to include maternal reports of child symptoms, behaviors and temperament.

Both sCCA analyses included the Phase 1 dataset with 19 maternal psychopathology and behavior variables and 2 variables that were included to quantify potential confounders (see Table 2A).

The first sCCA analysis (Analysis 1) included the Phase 2 dataset with 19 child behavior and pathology measures, all of which were measured during experiments or reported by the child himself or a clinician (see Table 2B). The second sCCA (Analysis 2) included 6 additional measures in the Phase 2 dataset, which were maternally reported observations concerning the child (see Table 2B). The reason we did not include these 6 variables in the first analysis was to be sure that results would not depend on potential maternal reporting biases in our analysis of the associations between Phase 1 and Phase 2 data.

Reliability and Power analysis

To assess whether our results were robust and reliable, we proceeded in five steps of reliability analyses: (1) leave-one out analysis, (2) Moser's RR-score (28), (3) a cross validation, (4) repeating sCCA with regressing out age, (5) repeating sCCA transforming each variable into ranks. In order to assess statistical power, we performed Monte Carlo style power analysis (see Supplement for details).

Results

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Groups did not differ on maternal or child-age at either time point, however, as expected, they did differ on PTSD symptom severity ($p < 0.001$ for both lifetime and current PTSD). See Table 1 for characteristics and group differences of demographic and other selected measures.

The initial sCCA (analysis 1, using Phase 1 maternal variables and Phase 2 child and clinician reported variables) showed a significant first mode ($r = 0.63$, $p = 0.030$). For analysis 1, the biggest contributions to the variate of phase 1 came from current and lifetime PTSD symptoms (weight = 0.39 and 0.35 respectively), depression (weight = 0.35), report of parental distress on the PSI (weight = 0.33), as well as dissociation symptoms (weight = 0.31). Additionally, maternal report of the child being exposed to violence already at Phase 1 (weight = 0.33), also contributed with a weight above 0.2 to the variate of phase 1. Additionally, SES also contributed with a weight of 0.23 (see Figure 1 and Table 3A). The number of child symptoms for PTSD (weight = 0.55), anxiety disorders (weight = 0.38), ADHD (weight = 0.28) and depression (weight = 0.25), as well as bullying perpetration (weight = 0.38) and victimization (weight = 0.27) contributed to the variate representing Phase 2. Child attributions of parents being harsh as rated via the MSSB also had a positive weight (0.22, see Figure 1 and Table 3B).

The sCCA of analysis 2 (additionally using maternally reported child variables for Phase 2) was more significant ($r = 0.69$, $p = 0.003$) than the analysis 1. The weights defining the variate of Phase 1 were again led by psychopathology measures, with PTSD (lifetime weight = 0.36, current PTSD weight = 0.35), dissociation (weight = 0.34) and depression symptoms (weight = 0.32) contributing the most. Other variables contributing with a weight above 0.2 included all PSI subscales (weights = 0.30, 0.26 and 0.25 respectively), and the alexithymia subscale for identification of feelings (weight = 0.22). Additionally, potential confounder variables of child sex (weight for girls = 0.24) and maternal report of child exposure to violence at Phase 1 (weight = 0.23) also contributed (see Figure 2 and Table 3A). The variate representing Phase 2 was contributed with weights >0.20 by the number of child symptoms for PTSD (weight = 0.41) and anxiety disorders (weight = 0.27), as well as bullying

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

perpetration (weight = 0.27) and victimization (weight = 0.20). Several of the maternally reported variables added for analysis 2 also had weights >0.20, including internalizing (weight = 0.35) and externalizing symptoms (weight = 0.22), as well as school life temperament measures for negative reactivity (weight = 0.39) and task persistence (weight = 0.32, see Figure 2 and Table 3B).

Reliability analysis indicated that mode 1 (but no other modes) of analysis 1 and 2 was reliable (see Supplement). We calculated that power was more than adequate to find an existing significant effect (see Supplement).

Discussion

We found - a dimensional relationship between 1) a maternal dataset from when children were toddlers that reflects maternal lifetime experience of IPV and related psychopathology (i.e., PTSD, depression, dissociation), parenting stress and the quality of maternal interactive behavior (i.e., maternal sensitivity) and 2) a follow-up dataset with a focus on child outcome measures from when the same children were school-aged that reflects child symptoms, behaviors including peer-aggression (i.e., bullying) and victimization. This relationship between maternal data and subsequent child outcomes was multivariate and dimensional in nature concerning both maternal predictors and child outcomes.

PTSD and comorbid psychopathology most strongly influenced the model among both maternal and child measures. However, among maternal predictors of child outcome, maternal psychopathology was accompanied by other measures related to stress, alexithymia, and atypical behavior, some of which reached almost the same weights. For the subsequent child dataset, it is important to note that the child's PTSD-like symptoms were most influential again, accompanied by other psychopathology symptoms (i.e., ADHD, depression, anxiety). However, other variables were also important. The fact that bullying and being bullied, carried notable weight, underscores the long-term effects of the family environment on children's social interaction and how their behavior can in turn affect their peer-interactions and therefore affect society in a broader perspective.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

These latter results support our hypothesis that, during early childhood, maternal PTSD symptom severity along with decreased maternal sensitivity with which PTSD severity is also associated (8, 10), predict increased peer-aggression and -victimization at school-age. This finding to our knowledge is a novel finding that contributes to our understanding of the influence of maternal IVP-PTSD as it can affect caregiving during the early sensitive period for the development of emotion regulation, on child school-age outcomes and subsequent risk. Further research is needed to explore this potential marker of intergenerational transmission of IVP and related psychopathology and to determine which individual child characteristics would render a child more likely at risk to perpetrate IVP vs be victimized.

An additional, novel and surprising finding was that maternal PTSD severity during early childhood predicted school-age child attributions of parents as being harsh on the story-stem completion task (MSSB). To our knowledge, no previously published study has studied this aspect of child mental representation or perception of parents during childhood. One published study of adults using retrospective measures had reported the association of offspring representations of parents as harsh and dysfunctional during childhood with family violence and maltreatment and subsequent disturbance in emotion regulation (29). This finding indicates that during clinical examination of children via observation of play narrative, harsh representations of parental figures might lead the clinician to inquire as to intergenerational IPV and associated psychopathology (i.e. IVP-PTSD).

Initial analyses were performed without including maternally reported measures of child psychopathology and temperament to ensure that associations transcended maternal response biases or an otherwise distorted vision of her child (for further discussion on differences between Model 1 and 2 see Supplement). Our findings echo and extend those of several prior studies on parental psychopathology and child outcomes (8, 30-33). Our findings are also in line with another study on maternal intimate partner violence and child experience (34). That study was more focused on PTSD symptoms, considering direct physical abuse alone. This latter study did not examine

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

comorbidities and other explicative factors; yet, similar to the present study, it reported that both mothers' experience of domestic violence, together with mothers' related PTSD, and those mothers' children's history of physical abuse and/or exposure to domestic violence were important predictors of all subscales of the children's PTSD, when they were between 8 and 17 years of age.

The dimensional nature and breadth of measures studied here - both those pertaining to maternal factors and child outcomes - underscore the complexity of factors to be considered when mothers have a history of violence and abuse. Early intervention targeting mother-child interactive behavior as well as maternal psychopathology, and thus several factors simultaneously, may therefore have long-term benefits for many at-risk individuals, given the prevalence of IPV and related psychopathology (35, 36). Moreover, the large number of child outcomes reflects the complexity and multi-dimensional (as opposed to a univariate categorical yes or no) nature, of the consequences of growing up during a sensitive period for the development of emotion regulation, in an environment with maternal IPV-related PTSD.

The complexity identified in this study supports and extends pre-existing literature on parental PTSD and its potential effects on caregiving. PTSD is indeed associated with a number of comorbid psychiatric disorders, such as major depressive disorder, which can also affect parenting skills(3). PTSD and comorbid depressive and dissociative symptoms, and their combined consequences on parenting skills can have an influence on a variety of child outcome measures and put children at greater risk for psychopathology, deficient socioemotional skills and propensity for aggressive behavior, such as bullying as well as victimization (4, 5).

Given the complexity and number of involved factors, the present study highlights important challenges that clinicians face when attempting to prevent the intergenerational transmission of IPV and related psychopathology. It is not only maternal psychopathology, such as PTSD that affects child outcomes, but also the co-occurring problems that often accompany PTSD, generally increased parenting stress (37) and decreased parental sensitive responsiveness in parent-child interactions(8,

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

10). Simply treating maternal PTSD symptoms can be an important start, yet such individual treatment is unlikely to be sufficient to address all accompanying problems in the parent-child relationship, such as low parental reflective functioning as a marker of the quality of the parent's attachment (i.e., attachment security and organization, 2, 38-40), as well as proneness to additional traumatization in the context of low SES (41-44) and a tendency to misappraise interpersonal cues that would alert a mother to a risk for violence in a new romantic relationship according to a nested study of a subset of the same mothers that participated in the present larger study (45, 46). The consequences of the combination of co-occurring risk factors for young children encompass a range of factors themselves. These include different kinds of psychopathology and behavioral difficulties, among which are increased likelihood of the perpetration of aggression and victimization. It is thus important to keep an open mind in family situations with histories of IPV and to monitor different kinds of symptoms and potentially ensuing difficulties for the children of parents with IPV-PTSD.

Limitations of this study are, however, those of the sample and the chosen measures. The focus of the sample on dyads in which the majority of mothers had experienced PTSD symptoms and childhood exposure to IPV permitted a good understanding of the intergenerational consequences of IPV. However, this focus on an important but very specific clinical population may make generalization to the larger population more difficult. While the extensive reliability and power analysis conducted for this study indicate the findings as reliable (see Supplement), It is possible that with more statistical power, a secondary sCCA mode focusing more on externalizing and aggression symptoms could have become significant and reliable. Further, while we believe that the chosen measures make sense within these datasets, they are by no means the only ones that might relate to the intergenerational cycle of violence, and future studies may want to widen the scope even further.

In conclusion, this is the first study to our knowledge to report prospective, longitudinal findings of a sample of children of mothers who suffered from IVP-PTSD during early childhood and who were

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

later studied using a range of different measures—both observed, child-reported, and maternal reported at school-age. Our study shows the complex dimensionality with which a multitude of factors around IPV related PTSD affect mother-child dyads prospectively and longitudinally. We argue that this points to the importance of understanding the transgenerational transmission of violence-related psychopathology as a multifactor phenomenon, both in origin and outcome, that is best described dimensionally rather than categorically (such as the presence of disorder yes/no). Children's social-emotional skills, not just symptoms, are reflected in the outcome measures selected, thereby providing an opportunity to observe distortions in children's understanding of relational meanings emerging in middle childhood. A particularly novel finding of this study involves the demonstration that maternal severity of PTSD and the quality (i.e. sensitivity) of related mother-child interactive behavior during early childhood, predicts peer-aggression (i.e. bullying) and -victimization at school-age. The results, in sum, imply the importance of focusing on traumatized parents' behavioral response to their young children's distress during clinical intervention. This plus attention to the inner worlds of parents and children—the latter, which the study characterized via the MacArthur Story Stem Battery as an observed behavioral and narrative measure, are propitious targets for restoring a healthier social-emotional developmental trajectory by school-age.

Financial Support

This study was funded by a Swiss National Science Foundation NCCR-SYNAPSY grant (n° 51AU40_125759).

Conflicts of Interest

The authors report no conflict of interest financial or otherwise.

Data availability

The data used for the analysis is available as a supplemental file of this paper

1. Tremblay RE, Nagin DS, Seguin JR, Zoccolillo M, Zelazo PD, Boivin M, et al. Physical aggression during early childhood: trajectories and predictors. Pediatrics. 2004;114(1):e43-50.
2. Slade A, Grienenberger J, Bernbach E, Levy D, Locker A. Maternal reflective functioning, attachment, and the transmission gap: a preliminary study. Attach Hum Dev. 2005;7(3):283-98.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

3. Berg-Nielsen TS, Vikan A, Dahl AA. Parenting related to child and parental psychopathology: A descriptive review of the literature. Clinical child psychology and psychiatry. 2002;7(4):529-52.
4. Morelen D, Shaffer A, Suveg C. Maternal emotion regulation: Links to emotion parenting and child emotion regulation. Journal of Family Issues. 2016;37(13):1891-916.
5. Ladd GW, Pettit GS. Parenting and the development of children's peer relationships. 2002.
6. Brady KT, Killeen TK, Brewerton T, Lucerini S. Comorbidity of psychiatric disorders and posttraumatic stress disorder. Journal of clinical psychiatry. 2000;61:22-32.
7. Keane TM, Kaloupek DG. Comorbid psychiatric disorders in PTSD: Implications for research. Annals of the New York Academy of Sciences. 1997;821(1):24-34.
8. Suardi F, Moser DA, Sancho Rossignol A, Manini A, Vital M, Merminod G, et al. Maternal reflective functioning, interpersonal violence-related posttraumatic stress disorder, and risk for psychopathology in early childhood. Attach Hum Dev. 2020;22(2):225-45.
9. Frewen PA, Dozois DJ, Neufeld RW, Lanius RA. Meta-analysis of alexithymia in posttraumatic stress disorder. Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies. 2008;21(2):243-6.
10. Schechter DS, Suardi F, Manini A, Cordero MI, Rossignol AS, Merminod G, et al. How do maternal PTSD and alexithymia interact to impact maternal behavior? Child psychiatry and human development. 2015;46(3):406-17.
11. Nobre-Trindade C, Caçador MI, Canavarro MC, Moreira H. Mothers' psychopathology symptoms and mindful parenting in the postpartum period: The role of parental reflective functioning. Infant Mental Health Journal. 2021.
12. Grabe HJ, Spitzer C, Freyberger HJ. Alexithymia and personality in relation to dimensions of psychopathology. The American journal of psychiatry. 2004;161(7):1299-301.
13. Krink S, Muehlhan C, Luyten P, Romer G, Ramsauer B. Parental Reflective Functioning Affects Sensitivity to Distress in Mothers with Postpartum Depression. Journal of Child and Family Studies. 2018;27(5):1671-81.
14. Lane RD, Sechrest L, Riedel R. Sociodemographic correlates of alexithymia. Comprehensive psychiatry. 1998;39(6):377-85.
15. Caron C, Rutter M. Comorbidity in child psychopathology: Concepts, issues and research strategies. Journal of child Psychology and Psychiatry. 1991;32(7):1063-80.
16. Belden AC, Sullivan JP, Luby JL. Depressed and healthy preschoolers' internal representations of their mothers' caregiving: associations with observed caregiving behaviors one year later. Attach Hum Dev. 2007;9(3):239-54.
17. Warren SL, Emde RN, Sroufe LA. Internal representations: predicting anxiety from children's play narratives. Journal of the American Academy of Child and Adolescent Psychiatry. 2000;39(1):100-7.
18. Kim JW, Lee K, Lee YS, Han DH, Min KJ, Song SH, et al. Factors associated with group bullying and psychopathology in elementary school students using child-welfare facilities. Neuropsychiatric disease and treatment. 2015;11:991.
19. Nigg JT. Temperament and developmental psychopathology. Journal of Child Psychology and Psychiatry. 2006;47(3-4):395-422.
20. Schipper M, Petermann F. Relating empathy and emotion regulation: do deficits in empathy trigger emotion dysregulation? Soc Neurosci. 2013;8(1):101-7.
21. Alvarez N, Lazaro MH, Gordo L, Elejalde LI, Pampliega AM. Maternal mentalization and child emotion regulation: A comparison of different phases of early childhood. Infant Behav Dev. 2022;66:101681.
22. Engel ML, Gunnar MR. The development of stress reactivity and regulation during human development. Int Rev Neurobiol. 2020;150:41-76.
23. Sancho Rossignol A, Lütthi Faivre F, Suardi F, Moser DA, I. CM, Rusconi Serpa S, et al. Geneva Socio-demographic Questionnaire (GSQ). 2010.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

24. Bretherton I, Oppenheim D, Buchsbaum H, Emde R, Group TMN. MacArthur Story Stem Battery coding manual. 1990.
25. Witten DM, Tibshirani R, Hastie T. A penalized matrix decomposition, with applications to sparse principal components and canonical correlation analysis. Biostatistics. 2009;10(3):515-34.
26. Ing A, Samann PG, Chu C, Tay N, Biondo F, Robert G, et al. Identification of neurobehavioural symptom groups based on shared brain mechanisms. Nat Hum Behav. 2019;3(12):1306-18.
27. Miragoli S, Balzarotti S, Camisasca E, Di Blasio P. Parents' perception of child behavior, parenting stress, and child abuse potential: Individual and partner influences. Child abuse & neglect. 2018;84:146-56.
28. Moser DA, Doucet GE, Lee WH, Rasgon A, Krinsky H, Leibu E, et al. Multivariate Associations Among Behavioral, Clinical, and Multimodal Imaging Phenotypes in Patients With Psychosis. JAMA Psychiatry. 2018;75(4):386-95.
29. Talevi D, Imburgia L, Luperini C, Zancla A, Collazzoni A, Rossi R, et al. Interpersonal violence: identification of associated features in a clinical sample. Child Abuse Negl. 2018;86:349-57.
30. Zaslow MJ, Weinfield NS, Gallagher M, Hair EC, Ogawa JR, Egeland B, et al. Longitudinal prediction of child outcomes from differing measures of parenting in a low-income sample. Developmental psychology. 2006;42(1):27.
31. Scheeringa MS, Zeanah CH. A relational perspective on PTSD in early childhood. Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies. 2001;14(4):799-815.
32. Schechter DS, Zygmunt A, Coates SW, Davies M, Trabka K, McCaw J, et al. Caregiver traumatization adversely impacts young children's mental representations on the MacArthur Story Stem Battery. Attach Hum Dev. 2007;9(3):187-205.
33. Ehrensaft MK, Cohen P, Brown J, Smailes E, Chen H, Johnson JG. Intergenerational transmission of partner violence: a 20-year prospective study. Journal of consulting and clinical psychology. 2003;71(4):741.
34. Castro M, Alcantara-Lopez M, Martinez A, Fernandez V, Sanchez-Meca J, Lopez-Soler C. Mother's IPV, Child Maltreatment Type and the Presence of PTSD in Children and Adolescents. Int J Environ Res Public Health. 2017;14(9).
35. Lieberman AF, Ghosh Ippen C, Van Horn P. Child-parent psychotherapy: 6-month follow-up of a randomized controlled trial. Journal of the American Academy of Child and Adolescent Psychiatry. 2006;45(8):913-8.
36. Miller TR. Projected Outcomes of Nurse-Family Partnership Home Visitation During 1996-2013, USA. Prev Sci. 2015;16(6):765-77.
37. McDonald S, Slade P, Spiby H, Iles J. Post-traumatic stress symptoms, parenting stress and mother-child relationships following childbirth and at 2 years postpartum. Journal of Psychosomatic Obstetrics & Gynecology. 2011;32(3):141-6.
38. Grienenberger JF, Kelly K, Slade A. Maternal reflective functioning, mother-infant affective communication, and infant attachment: exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. Attach Hum Dev. 2005;7(3):299-311.
39. Schechter DS, Myers MM, Brunelli SA, Coates SW, Zeanah CH, Davies M, et al. Traumatized mothers can change their minds about their toddlers: Understanding how a novel use of videofeedback supports positive change of maternal attributions. Infant Ment Health J. 2006;27(5):429-47.
40. Moser DA, Suardi F, Rossignol AS, Vital M, Manini A, Serpa SR, et al. Parental Reflective Functioning correlates to brain activation in response to video-stimuli of mother-child dyads: Links to maternal trauma history and PTSD. Psychiatry Res Neuroimaging. 2019;293:110985.
41. Burns PA, Zunt JR, Hernandez B, Wagenaar BH, Kumar M, Omolo D, et al. Intimate Partner Violence, Poverty, and Maternal Health Care-Seeking Among Young Women in Kenya: a Cross-

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Sectional Analysis Informing the New Sustainable Development Goals. Glob Soc Welf. 2020;7(1):1-13.
42. Yakubovich AR, Heron J, Feder G, Fraser A, Humphreys DK. Long-term Exposure to Neighborhood Deprivation and Intimate Partner Violence Among Women: A UK Birth Cohort Study. Epidemiology. 2020;31(2):272-81.
43. Lowe SR, Galea S, Uddin M, Koenen KC. Trajectories of posttraumatic stress among urban residents. Am J Community Psychol. 2014;53(1-2):159-72.
44. White SF, Voss JL, Chiang JJ, Wang L, McLaughlin KA, Miller GE. Exposure to violence and low family income are associated with heightened amygdala responsiveness to threat among adolescents. Dev Cogn Neurosci. 2019;40:100709.
45. Berthelot N, Lemieux R, Garon-Bissonnette J, Lacharité C, Muzik M. The protective role of mentalizing: Reflective functioning as a mediator between child maltreatment, psychopathology and parental attitude in expecting parents. Child Abuse Neglect. 2019;95:104065.
46. Perizollo Pointet VC, Moser DA, Vital M, Serpa SR, Todorov A, Schechter DS. Violence Exposure Is Associated With Atypical Appraisal of Threat Among Women: An EEG Study. Frontiers in psychology. 2021;11.
47. Abidin RR. Parenting Stress Index (3rd ed.). Odessa, FL: Psychological Assessment Resources; 1995.
48. Toucheque M, Etienne A-M, Stassart C, Catale C. Validation of the French version of the parenting stress index–short form. Journal of Community Psychology. 2016;44(4):419-25.
49. Briere J, Runtz M. Augmenting Hopkins SCL scales to measure dissociative symptoms: data from two nonclinical samples. J Pers Assess. 1990;55(1-2):376-9.
50. Kubany ES, Haynes SN, Leisen MB, Owens JA, Kaplan AS, Watson SB, et al. Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: the Traumatic Life Events Questionnaire. Psychol Assess. 2000;12(2):210-24.
51. Cordero MI, Moser DA, Suardi F, Rusconi Serpa S, S. SD. The Geneva Child Exposure to Violence Questionnaire (CETV). . 2010.
52. Beck AT, Steer RA, Brown GK. Beck depression inventory (BDI-II): Pearson; 1996.
53. Wagener A, Blairy S. Validation and psychometric properties of the French versions of the environmental reward observation scale and of the reward probability index. Psychologica Belgica. 2015;55(2):71.
54. Slade A. Parental reflective functioning: An introduction. Attachment & human development. 2005;7(3):269-81.
55. Zeanah CH, Benoit D. Clinical applications of a parent perception interview in infant mental health. Child and Adolescent Psychiatric Clinics of North America. 1995;4(3):539-54.
56. Schechter DS, Coots T, Zeanah CH, Davies M, Coates SW, Trabka KA, et al. Maternal mental representations of the child in an inner-city clinical sample: violence-related posttraumatic stress and reflective functioning. Attach Hum Dev. 2005;7(3):313-31.
57. Weathers FW, Keane TM, Davidson JR. Clinician-administered PTSD scale: a review of the first ten years of research. Depress Anxiety. 2001;13(3):132-56.
58. Pupo MC, Jorge MR, Schoedl AF, Bressan RA, Andreoli SB, Mello MF, et al. The accuracy of the Clinician-Administered PTSD Scale (CAPS) to identify PTSD cases in victims of urban violence. Psychiatry Res. 2011;185(1-2):157-60.
59. Crittenden PM. CARE-index toddlers coding manual. 2006.
60. Lima EdP, Barreto SM, Assunção AÁ. Factor structure, internal consistency and reliability of the Posttraumatic Stress Disorder Checklist (PCL): an exploratory study. Trends in psychiatry and psychotherapy. 2012;34(4):215-22.
61. Wilkins KC, Lang AJ, Norman SB. Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. Depression and anxiety. 2011;28(7):596-606.
62. Bagby RM, Parker JDA, Taylor GJ. The 20-Item Toronto-Alexithymia-Scale .1. Item Selection and Cross-Validation of the Factor Structure. J Psychosom Res. 1994;38(1):23-32.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

63. Bagby RM, Taylor GJ, Parker JDA. The twenty-item Toronto Alexithymia Scale—II. Convergent, discriminant, and concurrent validity. J Psychosom Res. 1994;38(1):33-40.
64. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington, VA: American psychiatric Publishing; 2013.
65. Dealy J, Mudrick H, Robinson J. Children's narrative story stem responses: Contributions of executive functioning and language proficiency to relationship representations. Soc Dev. 2019;28(1):168-85.
66. Chan JHF, Myron R, Crawshaw M. The efficacy of non-anonymous measures of bullying. School Psychol Int. 2005;26(4):443-58.
67. Achenbach T, Achenbach T, Achenbach T. Integrative Guide to the 1991 CBCL/4-18, YSR, and TRF Profiles. 1991.
68. Bied A, Biederman J, Faraone S. Parent-based diagnosis of ADHD is as accurate as a teacher-based diagnosis of ADHD. Postgrad Med. 2017;129(3):375-81.
69. Pons F, Harris P. Test of emotion comprehension: TEC: University of Oxford; 2000.
70. McClowry SG. The development of the School-Age Temperament Inventory. Merrill-Palmer Quarterly. 1995;41: 271–85.
71. McClowry SG, Halverson CF, Sanson A. A re-examination of the validity and reliability of the School-Age Temperament Inventory. Nurs Res. 2003;52(3):176-82.
72. Fox N, Leavitt L. The Violence Exposure Scale for Children-Revised (VEX-R). College Park, MD: University of Maryland. 1995.
73. Macfie J, Toth SL, Rogosch FA, Robinson J, Emde RN, Cicchetti D. Effect of maltreatment on preschoolers' narrative representations of responses to relieve distress and of role reversal. Dev Psychol. 1999;35(2):460-5.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

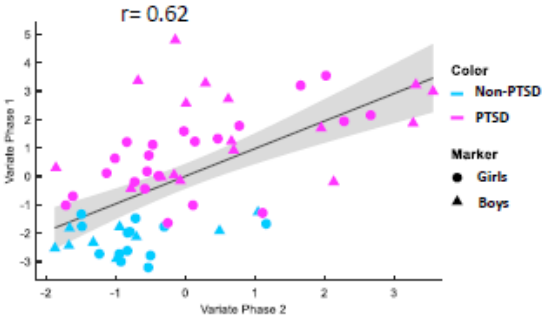
Figure 1.

Title: Results of the first sCCA analysis.

Caption: Top left assigned weights (>0.2) of Mode 1 for the Phase 1 variate, Top right scatter plot of mode 1, stratified by maternal PTSD status and child sex for illustrative purposes. Bottom left: significance and reliability measures, bottom right weights (>0.2) for the phase 2 variate. Abbreviations: PTSD: Post traumatic Stress Disorder, BDI: Beck Depression Inventory, CBCL: Child Behavior Checklist, IPV: Interpersonal Violence, PCL-S: Posttraumatic stress disorder Checklist Scale, PSI: Parenting Stress Index, PTSD: Post traumatic Stress Disorder, TAS20: Toronto Alexithymia Scale.

Results of sparse Canonical Correlation, Phase 2 using Child and Clinician reported Measures only

Measures Phase 1	Weight
Current IPV-PTSD (PCL-S)	0.39
Depression (BDI)	0.36
Lifetime PTSD (CAPS)	0.35
Parental Distress (PSI)	0.33
Child Exposed to Violence	0.32
Dissociation (Hopkins)	0.31
Socio Economic Status	0.23



Indicator	Value
Significance	0.030
Mean test set r	0.23
Mean Moser RR score	0.70
Leave one out minimum correlation with actual weights	>0.97

Measures Phase 2	Weight
PTSD Symptoms	0.55
Anxiety Disorders Symptoms	0.38
Bullying (Perpetration)	0.38
ADHD Symptoms	0.28
Bullying (Victimization)	0.27
Depression Symptoms	0.25
MacArthur: Negative Attributions: Harsh Parents	0.22

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Figure 2.

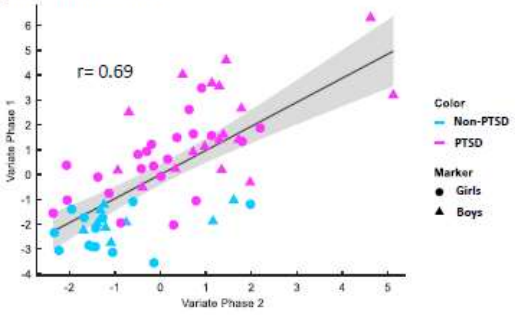
Title: Results of the second sCCA analysis

Caption: Top left assigned weights (>0.2) of Mode 1 for the Phase 1 variate, Top right scatter plot of mode 1 stratified by maternal PTSD status and child sex for illustrative purposes. Bottom left: significance and reliability measures, bottom right weights (>0.2) for the phase 2 variate. Abbreviations: BDI: Beck Depression Inventory, CBCL: Child Behavior Checklist, PCL-S : Posttraumatic stress disorder Checklist Scale, PSI: Parenting Stress Index, PTSD: Post traumatic Stress Disorder, IPV: Interpersonal Violence, TAS20: Toronto Alexithymia Scale.

Results of sparse Canonical Correlation, Phase 2 using Child, Clinician and Maternal reported Measures

Measures Phase 1	Weight
Lifetime PTSD (CAPS)	0.36
Current IPV-PTSD (PCL-S)	0.35
Dissociation (Hopkins)	0.34
Depression (BDI)	0.32
Parental Distress (PSI)	0.30
Difficult Child (PSI)	0.26
Parent Child Dysfunctional interaction (PSI)	0.25
Sex (high = Girls)	0.24
Child Exposed to Violence	0.23
Alexithymia: Identification of Feelings (TAS20)	0.22

Indicator	Value
Significance	0.003
Mean test set r	0.35
Mean Moser RR score	0.77
Leave one out minimum correlation with actual weights	>0.97



Measures Phase 2	Weight
PTSD Symptoms	0.41
School Life Temperament: Negative Reactivity	0.39
Internalizing Symptoms (CBCL)	0.35
School Life Temperament: Task Persistence	0.32
Anxiety Disorders Symptoms	0.27
Bullying (Perpetration)	0.27
Externalizing Symptoms (CBCL)	0.22
Bullying: Victimization	0.20

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

548 **Table 1: Sample characteristics and selected measures compared by group.**

	Overall (n=62) Mean (SD) / Percentage	PTSD (n=40) Mean (SD) / Percentage	Non-PTSD (n=22) Mean (SD) / Percentage	p-value for significance of difference (t-test or Mann-Whitney test)
Phase 1 Demographics				
Maternal Age (Years)	35.1 (5.7)	34.5 (5.9)	35.6 (5.5)	0.51
Child Age (Months)	27.0 (8.6)	29.4 (8.4)	27.7 (8.4)	0.45
Socio Economic Status (high status = low value)	5.0 (1.9)	5.3 (1.8)	4.4 (1.9)	0.07
Child Sex (% Boys)	56%	55%	59%	0.76
Phase 1 Maternal Measures				
Lifetime PTSD score (CAPS)	60.0 (35.5)	82.6 (21.6)	18.8 (5.9)	<0.001
Current PTSD score (PCL-S)	32.4 (14.8)	40.9 (11.3)	16.9 (2.0)	<0.001
Depression Symptoms	9.2 (7.7)	12.3 (10.5)	3.6 (3)	<0.001
Psychological Dissociation	14.8 (11.1)	19.1 (11.3)	6.8 (6.5)	<0.001
Maternal Sensitivity	5.2 (1.3)	4.7 (1.1)	6.0 (1.2)	<0.001
Experience trauma during adulthood	31%	41%	13%	0.03
Physical abuse during childhood	53%	55%	50%	0.71
Sexual abuse during childhood	21%	27%	9%	0.09
Phase 2 Child Measures				
Maternal Age (Years)	39.7 (5.6)	39.3 (5.8)	40.5 (5.3)	0.41
Child Age (Months)	84.0 (12.9)	83.2 (13.7)	85.4 (11.5)	0.52

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Bullying (Perpetrator)	0.8 (1.0)	1.0 (1.0)	0.4 (0.9)	0.06
Bullying (Victim)	4.3 (8.0)	5.1 (9.4)	2.8 (3.9)	0.32
PTSD symptoms	2.2 (3.1)	3.0 (3.7)	0.9 (1.3)	0.01
Anxiety Disorder Symptoms	3.5 (3.3)	4.1 (3.6)	2.6 (2.6)	0.10
Depression Symptoms	1.5 (1.5)	1.6 (1.5)	1.4 (1.6)	0.50
Behavioral Disorder Symptoms	1.4 (1.9)	1.4 (1.8)	1.4 (2.0)	0.90
ADHD Symptoms	1.1 (1.4)	1.3 (1.5)	0.7 (1.2)	0.09

549 Abbreviations: ADHD, Attention Deficit/Hyperactivity Disorder; CAPS, Clinician Administered PTSD
550 Scale; PCL-S, Posttraumatic stress disorder Checklist Scale; PTSD, Post-Traumatic Stress Disorder; SD,
551 Standard Deviation.

552

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

553 **Table 2A: Measures of maternal dataset including maternal variables during Phase 1 as well as**
554 **selected potential confounders**.

Measure	Description	Measure	Description
Socio Economic Status	Socioeconomic status as measured by the Geneva Sociodemographic Questionnaire (GSQ) (23)	**PSI subscale Parent Child Dysfunctional interaction**	Subscale of the Parenting stress index short form (47). Measures degree to which parent perceives child as not meeting expectations / rendering role of parent difficult. Subscale Cronbach's alpha: 0.79 (48)
Sex of the child	Question part of the GSQ	**PSI subscale Difficult Child**	Subscale of the Parenting stress index short form (47). Measures degree parent perceives child as difficult to manage. Subscale Cronbach's alpha: 0.79 (48)
Dissociation (Hopkins)	Dissociate Symptoms as measured by the Hopkins dissociative symptoms checklist (49), Cronbach's alpha: between 0.85 and 0.90 (49)	**PSI subscale Parental Distress**	Subscale of the Parenting stress index short form (47). Measures stress as a function directly related to parenting. Subscale Cronbach's alpha: 0.81 (48)
BPSAQ	Yes or no, did the participant experience traumatic events during adulthood. This was used along with the TLEQ (50)	**Child exposure to violence at Phase 1**	Maternally reported questionnaire (51) on violence experienced or witnessed by the child, scored with importance of relationship with perpetrator and frequency included
BPSAQ PA	Yes or no, did the participant experience physical abuse during childhood. This was used along with the TLEQ (50)	**Depression**	Current symptoms of depression as measured with the Becks Depression Inventory (52). Cronbach's alpha: 0.94 (53)
BPSAQ SA	Yes or no, did the participant experience sexual abuse during childhood. This was used along with the TLEQ (50)	**Narrative coding: Parental Reflective Functioning**	Coding of the Working Model of the Child Interview, (54-56) Measures parents' capacity to recognize mental states in oneself and one's child and to appropriately relate them to each other's behavior.
CAPS	Lifetime symptoms of interpersonal violence related PTSD symptoms using the clinician administered PTSD Scale (57, 58), Cronbach's alpha: 0.97 (58)	**CARE-Index video coding: Maternal Sensitive behavior**	Coding of mother-child interaction following Crittenden (59). Measures maternal tendency to sense and react appropriately to child's needs. Intra-class correlation (ICC) for the CARE-Index general: r = .925, p < .001. Coder agreement regarding the attachment-related classifications: c2 =

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

			24.167, p = .004; kappa = .841
PCL-S	Symptoms of interpersonal violence related PTSD symptoms in the last 6 months using the PTSD check-list short form (60), Cronbach's alpha: 0.94 (61)	**CARE-Index video coding: Maternal Controlling Behavior**	Coding of mother-child interaction following Crittenden (59). Measures maternal tendency to behave intrusively with the child. Intra-class correlation (ICC) for the CARE-Index general: r = .925, p < .001. Coder agreement regarding the attachment-related classifications: c2 = 24.167, p = .004; kappa = .841
Alexithymia: Difficulty Identifying Feelings	Symptoms of alexithymia, subscale trouble with identification of feelings, as measured with the Toronto Alexithymia Scale (TAS-20; 62). Cronbach's alpha: 0.81, test-retest reliability: 0.77 (63)	**CARE-Index video coding: Maternal unresponsive behavior**	Coding of mother-child interaction following Crittenden (59). Measures maternal tendency to be avoidant or withdrawn in interactions with the child. Intra-class correlation (ICC) for the CARE-Index in general: r = .925, p < .001. Coder agreement regarding the attachment-related classifications: c2 = 24.167, p = .004; kappa = .841
Alexithymia: Difficulty Describing Feelings	Symptoms of alexithymia, subscale trouble with description of feelings, as measured with the TAS-20. Cronbach's alpha: 0.81, test-retest reliability: 0.77 (63)	**Parental drug/alcohol use disorder**	Yes / No Has a parent of the child had a substance use disorder during the life of the child
Alexithymia: Externally-Oriented Thinking	Symptoms of alexithymia, subscale externally oriented thinking, as measured with the TAS-20. Cronbach's alpha: 0.81, test-retest reliability: 0.77 (63)		

555 Table 2A: Abbreviations: BPSAQ: Brief Physical and Sexual Abuse Questionnaire; CAPS: Clinician
556 Administered PTSD Scale, GSQ: Geneva Sociodemographic Questionnaire, PA: Physical Abuse, PCL-S:
557 Posttraumatic stress disorder Checklist Scale, PSI: Parenting Stress Index, PTSD: Posttraumatic Stress
558 Disorder, SA: Sexual Abuse, TAS-20: Toronto Alexithymia Scale.

559 **Table 2B: Measures of child outcome dataset at Phase 2.**

Measure	Description	Measure	Description
ADHD	Number of ADHD symptoms Child	**MacArthur:**	Child represents parents

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Symptoms	symptoms originally reported by child and judged by clinician in accordance with DSM-V (64).	**Negative Parent: ineffectual**	as ineffectual to address story stem challenges (65).
Behavioral disorders Symptoms	Combined number of child symptoms originally reported by child and judged by clinician of oppositional defiant disorder and conduct disorders symptoms in accordance with DSM-V (64).	**MacArthur: Negative Parent: harsh**	Child represents parents as harsh as they address story challenges (65).
Depression symptoms	Number of depression symptoms Child symptoms originally reported by child and judged by clinician in accordance with DSM-V (64).	**MacArthur: Negative story endings**	Number of stories that have emotionally negative endings (65)
Anxiety Disorders Symptoms	Combined number of child symptoms originally reported by child and judged by clinician for generalized anxiety disorder and separation anxiety disorder in accordance with DSM-V (64).	**MacArthur: Aggression overall sum**	Overall sum of aggressions incorporated in stories (65)
PTSD symptoms	Number of child PTSD symptoms originally reported by child and judged by clinician in accordance with DSM-5 (64).	**MacArthur: Atypical negative**	Percent stories with atypical, often bizarre, representation with negative connotation (65)
Bullying (Perpetration)	Experiences of bullying, measured with the school life survey (66)	**MacArthur: Danger**	Sum of diverse danger situations child includes in stories (65)
Bullying: Victimization	Experiences of being the victim of bullying, measured with the school life survey (66)	**CBCL internalizing***	Internalizing symptoms according to the child Behavior Checklist (67, 68)
Emotion Comprehension: External emotions understanding	Test of emotion comprehension (69), subscale to measure understanding of facial emotions and external causes of emotion	**CBCL: Externalizing symptoms***	Externalizing symptoms according to the Child Behavior Checklist.
Emotion Comprehension: Mental understanding	Test of emotion comprehension (69), subscale to measure understanding of belief based emotions, and possibility of hidden emotions	**School Life: temperament: negative reactivity***	Negative reactivity, i.e. strong reactions emotional / behavioral reactions to experiencing negative events as measured in the SATI (70). Cronbach's alpha (English version) >0.89 (71)
Emotion Comprehension: Reflective capacities	Test of emotion comprehension (69), subscale to measure understanding of mixed emotions, emotion regulation and self-reflection	**School Life: Temperament: Task Persistence***	Task persistence, i.e. Failure to persist or self-direct with tasks and chores, as measured by the SATI. Cronbach's alpha (English version) >0.89 (71)

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

VEX Total physical and nonphysical	Reported exposure to violence and criminal activity according to the clinician-administered Violent Experiences Scale (VEX-R) (72). Cronbach's alpha (English version): between 0.72 and 0.86 (72)	**School Life: Temperament: approach/ withdrawal***	Tendency to be shy, withdraw or not approach others as measured by SATI. Cronbach's alpha (English version) >0.84 (71)
MacArthur: Avoidant Strategies	Number of behaviors and strategies by child that keep a story from moving forward (65)	**School Life: Temperament: Activity***	High and potentially hyper or impulsive activity as measured by the SATI. Cronbach's alpha (English version) >0.80 (71)
MacArthur: Dissociative Strategies	Number of dissociative behaviors by child during stories (73)		

Table 2B. * As reported by the mother, only part of Analysis 2, but not of Analysis 1 analysis. Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder, CBCL: Child Behavior Checklist, K-SADS: Schedule for Affective Disorders and Schizophrenia for School-Aged Children, MSSB: MacArthur Story Stem Battery, PTSD: Posttraumatic Stress Disorder, SATI: School-Age Temperament Inventory, VEX-R: Violence Exposure Scale – Revised.

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Table 3: Weight contributions of the first modes of sparse canonical analysis 1 and 2. A) For Phase 1 maternal dataset; B) for Phase 2 Child dataset.

Table 3A

Measure Phase 1	**Weight Analysis 1**	**Weight Analysis 2**
Current PTSD (PCLS)	0.39	0.35
Livetime PTSD (CAPS)	0.35	0.36
Depression (BDI)	0.36	0.32
Dissociation (Hopkins)	0.31	0.34
Parenting Stress Index: Parental Distress	0.33	0.30
Child Witness of Violence	0.32	0.23
Alexithymia: Difficulty Identifying Feeling	0.23	0.22
Parenting Stress Index: Parent Child Dysfunctional interaction	0.17	0.25
Socio Economic Status	0.18	0.13
Parenting Stress Index: Difficult Child	0.16	0.26
Controlling Maternal Behavior (Crittenden)	0.16	0.18
Childhood Sexual Abuse (BPSAQ)	0.14	0.17
Adult Partner Violence (BPSAQ)	0.11	0.16
Alexithymia:Difficulty Describing Feelings	0.10	0.13
Parental Reflective Functioning	0.11	0.05
Parent is Drug/Alcohol Abuser	0.08	0.06
Alexithymia: Externally-Oriented Thinking	0.03	0.08
Unresponsive Maternal Behavior (Crittenden)	-0.04	-0.06
Childhood Physical Abuse (BPSAQ)	-0.12	0.00
Sensitive Maternal behavior (Crittenden)	-0.13	-0.09
Sex Child (higher = more boys)	-0.14	-0.24

Table 3B

Measure Phase 2	**Weight Analysis 1**	**Weight Analysis 2**
PTSD Symptoms	0.55	0.41
School Life: temperament: Negative Reactivity		0.39
Internalizing Symptoms (CBCL)		0.35
Anxiety Disorders Symptoms	0.38	0.27
Bullying: Perpetration	0.38	0.27
School Life: Temperament: Task Persistence		0.32
ADHD Symptoms	0.28	0.19
Bullying: Victimization	0.27	0.20
Externalizing Symptoms (CBCL)		0.22
Depression Symptoms	0.25	0.19
MacArthur: Negative Parent Representation- Harsh	0.22	0.16
Emotion Comprehension: Mental Understanding	0.11	0.09
School Life: Temperament: Approach/Withdrawal		0.08
School Life: Temperament: Activity		0.05
MacArthur: Dissociative Strategies	0.01	0.00

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press

Behavioral disorders Symptoms	0.02	-0.02
MacArthur: Aggression	0.00	-0.01
MacArthur: Atypical Negative Behaviors	0.00	-0.02
Report of Physical and Nonphysical Exposure to Violence and Crime (VEX)	-0.04	-0.05
Emotion Comprehension: Reflective Capacities	-0.11	-0.05
Emotion Comprehension: External Emotions Understanding	-0.12	-0.10
MacArthur: Avoidance	-0.15	-0.12
MacArthur: Negative Endings	-0.15	-0.15
MacArthur: Danger	-0.16	-0.15
MacArthur: Negatitive : Parents Ineffectual	-0.19	-0.16

572

573 Table 3 weights of sCCA analyses. Analysis 1 includes only child measures given by clinician,
574 experiment or children themselves, while analysis 2 also includes maternally reported child
575 measures as outcomes. Abbreviations: ADHD: Attention Deficit Hyperactivity Disorder, CBCL: Child
576 Behavior Checklist, MacArthur: MacArthur Story Stem Battery, PTSD: Posttraumatic Stress Disorder,
577 VEX: Violence Exposure Scale – Revised.

578

https://doi.org/10.1192/j.eurpsy.2023.8 Published online by Cambridge University Press