EUROPEAN JOURNAL OF
PSYCHO-
TRAUMATOLOGY
THE OFFICIAL JOURNAL OF THE EUROPEAN SOCIETY FOR TRAUMATIC STRESS STUDIES

Taylor & Francis
Taylor & Francis Group

BASIC RESEARCH ARTICLE

🔓 OPEN ACCESS
Check for updates

Impact of mothers' IPV-PTSD on their capacity to predict their child's emotional comprehension and its relationship to their child's psychopathology

V. C. Pointet Perizzolo[a], J. Glaus [b], C. R. Stein [c], E. Willheim[c], M. Vital[a,d], E. Arnautovic[d], K. Kaleka[e], S. Rusconi Serpa[f], F. Pons[g], Dominik A. Moser [b,h] and D. S. Schechter [a,b,c,i]

[a]Department of Psychiatry, Faculty of Medicine, University of Geneva, Geneva, Switzerland; [b]Department of Psychiatry, University Service of Child and Adolescent Psychiatry, Lausanne University Medical Center, Lausanne, Switzerland; [c]Department of Child and Adolescent Psychiatry, New York University Grossman School of Medicine, New York, NY, USA; [d]Department of Child and Adolescent Psychiatry, University of Geneva Hospitals, Geneva, Switzerland; [e]College of Medicine, Central Michigan University, Mount Pleasant, Michigan, USA; [f]Faculty of Psychology, University of Geneva, Geneva, Switzerland; [g]Department of Psychology, University of Oslo, Oslo, Norway; [h]Institute of Psychology, University of Bern, Bern, Switzerland; [i]Department of Psychiatry, Faculty of Biology and Medicine, University of Lausanne, Lausanne, Switzerland

ABSTRACT

Background: Previous studies demonstrated that when the violence-exposed child becomes a mother and interacts with her own child during early sensitive periods for social-emotional development, she may have difficulties providing sensitive responsiveness to the child's emotional communication. Such difficulties place the child's development of emotional comprehension (EC) and related self-regulation at risk. The aim of this study was to examine how mothers' interpersonal violence-related posttraumatic disorder (IPV-PTSD) would affect their children's EC and their own ability to predict their children's EC. We also investigated how mothers' predictive ability would correlate with child psychopathology.

Methods: Sixty-one mother–child dyads (36 with IPV-PTSD) participated in this study. Children's (mean age = 7.0 years, SD = 1.1) EC was assessed with the Test of Emotion Comprehension (child TEC) and their psychopathology as reported by the mother was assessed with the Child Behaviour Checklist (CBCL) and as evaluated by a clinician using selected modules of the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS). Mothers were measured for IPV-PTSD with the Clinician Administered PTSD Scale (CAPS) and for their capacity to predict their child's emotional comprehension (mother-responding-as-child TEC; mTEC).

Results: We found no significant between-group differences in children's level of EC. Maternal PTSD was associated with lower scores on the mTEC, however. Reduced maternal scores on the mTEC were significantly associated with maternal report of increased aggressive child behaviour and with depression symptoms on the K-SADS. Further, scores on the mTEC interacted with maternal report of child aggression on child oppositional defiant disorder (ODD) symptoms on the K-SADS.

Conclusion: These findings support that improving maternal emotional comprehension may help reduce child risk for psychiatric morbidity in this population.

HIGHLIGHTS
• Maternal estimation of children's responses (mTEC) on the test emotion comprehension is reduced among mothers with PTSD.
• Low mTEC associated with high maternal estimation of child aggression.
• Low mTEC associated with more child depression symptoms on child/clinician report.

Impacto del trastorno de estrés postraumático por violencia interpersonal de las madres sobre su capacidad de predecir la comprension emocional del nino y su relación con la psicopatologia del nino

Antecedentes: Los estudios previos demostraron que cuando la niña expuesta a violencia llega a ser madre e interactúa con su propio hijo durante periodos críticos tempranos para el desarrollo socioemocional, ella podría tener dificultades para brindar una respuesta sensible a la comunicación emocional del niño. Tales dificultades podrían poner en riesgo el desarrollo de la comprensión emocional del niño (CE) y la autorregulación asociada a ella. El objetivo de este estudio fue evaluar cómo el trastorno de estrés postraumático por violencia interpersonal de las madres (TEPT-VIF) podría afectar tanto la CE de sus hijos como su propia capacidad de predecir la CE en sus hijos. También investigamos cómo la capacidad predictiva de las madres podría correlacionarse con psicopatología infantil.

Métodos: En este estudio participaron sesenta y una diadas madre-hijo (36 con TEPT-VIF). La CE de los niños (edad media = 7.0 años, DE = 1.1) fue evaluada mediante la prueba de Comprensión Emocional (TEC en sus siglas en inglés) del niño. Asimismo, la psicopatología

del niño, según lo reportado por la madre, fue evaluada con la Lista de Chequeo Conductual del Niño (CBCL en sus siglas en inglés) y según la evaluación de un médico utilizando módulos seleccionados de la Escala Infantil para Trastornos Afectivos y Esquizofrenia (K-SADS por sus siglas en inglés). En las madres, se midió tanto el TEPT-VIF mediante la Escala para el Trastorno de Estrés Postraumático Administrada por el Clínico (CAPS en sus siglas en ingles) como su capacidad de predecir la comprensión emocional del niño mediante la prueba de Comprensión Emocional en la que la madre responde como el niño (mTEC en sus siglas en inglés).
Resultados: No encontramos diferencias significativas entre los grupos en los niveles de CE de los niños. Sin embargo, el trastorno de estrés postraumático materno estuvo asociado a puntajes más bajos en el mTEC. Los puntajes maternos bajos en el mTEC estuvieron significativamente asociados en la K-SADS a un reporte materno de un aumento de la conducta agresiva del niño y a síntomas depresivos. Adicionalmente, los puntajes en el mTEC estuvieron relacionados en la K-SADS con un reporte materno de agresión del niño dentro de los síntomas del trastorno oposicionista desafiante (TOD).
Conclusión: Estos hallazgos respaldan que el mejorar la comprensión emocional materna podría ayudar a disminuir el riesgo infantil de morbilidad psiquiátrica en esta población.

母亲的 IPV-PTSD 对其预测孩子情绪理解能力的影响及其与孩子精神病的关系

背景: 前人研究表明, 当在社会情感发展的早期敏感时期遭受暴力的孩子成为母亲并与自己的孩子互动时, 她可能难以对孩子的情感交流做出敏感的反应。这些困难使得孩子的情绪理解力 (EC) 和相关的自我调节能力面临风险。本研究旨在考查母亲的人际暴力相关的创伤后障碍 (IPV-PTSD) 如何影响其孩子的 EC 以及她们自己预测孩子 EC 的能力。我们还探究了母亲的预测能力与儿童精神病如何相关。
方法: 61 位母子对 (36 位患有 IPV-PTSD) 参与了此研究。儿童 (平均年龄 = 7.0 岁, SD = 1.1) 的 EC 使用情绪理解测验 (儿童 TEC) 进行评估, 母亲报告的精神病使用儿童行为检查表 (CBCL) 进行评估, 并由临床用情感障碍和精神分裂症儿童计划 (K-SADS) 的选定模块估计。使用临床用 PTSD 量表 (CAPS) 测量了母亲的 IPV-PTSD 及其预测孩子情绪理解的能力 (母亲响应孩子的 TEC; mTEC) 。
结果: 我们发现儿童 EC 水平的组间差异不显著。然而, 母亲 PTSD 与较低的 mTEC 分数相关。母亲在 mTEC 上评分更低与母亲报告的儿童攻击性行为增加以及 K-SADS 的抑郁症状显著相关。此外, mTEC 分数与母亲对 K-SADS 上儿童对立违抗障碍 (ODD) 症状的儿童攻击性报告有交互作用。
结论: 这些发现支持改善母亲情绪理解力可能有助于降低此群体中儿童患精神病的风险。

1. Introduction

Emotional comprehension is the capacity of an individual to understand the nature, cause and consequences of emotions in self and others (Pons, Harris, & de Rosnay, 2004). Its main function is to identify, explain, predict and enable changes in everyday emotional experience. Formative development of emotional comprehension occurs during early childhood (i.e. ages 0–5 years) and is linked to social relationship with peers and adults (Pons, Harris, & Doudin, 2002). Yet this capacity continues to develop as cognitive and metacognitive abilities that require abstract thinking increase through preadolescence. Emotional comprehension and expression are interrelated (Nook et al., 2020); and so it is crucial to understand both how the developmental capacity for emotional expression develops from birth on and how it interacts with the caregiving environment. Infants and very young children do not yet have the ability to put their feelings into words. They rather express affect via facial expression, posture, gesture and vocalization. It is this expression of affect that the caregiver appraises, interprets, and labels as communicating a specific 'emotion' in order for the child to begin to make meaning of and put words to his emotions (Calkins, 1994).

Typically, parents also provide verbal and non-verbal indications as to whether their child's emotional expression signals actual danger and a need for immediate action or not. Towards this end, parents (Gergely & Watson, 1996, p. 1191) tend to 'mark' what their young child is feeling in a given situation through nuanced facial, postural, gestural and vocal feedback that lets the child know that the parent is able to process and contain the child's perspective while remaining an adult who provides safety, limits, and comfort. Usually, the parent comprehends and then shows that understanding of the child's affective communication, ideally without ignoring or becoming overwhelmed by the child's emotions. This comprehension when signalled by the marking of affect by the parents allows their children to gain metacognitive distance from feelings, and to begin to understand links between underlying sensations and states of mind that inform action (Cicchetti, Ganiban, & Barnett, 1991; Fonagy, 1996; Supplee, Skuban, Trentacosta, Shaw, & Stoltz, 2011).

Individuals who have experienced interpersonal violence by attachment figures on whom they depend for safety, sustenance, and comfort, are at particular risk for psychopathology such as posttraumatic stress disorder (PTSD), often of complex type (Bailey, Moran, & Pederson, 2007; Miller-Graff & Howell, 2015). We

wondered what happens when a maltreated or otherwise violence-exposed child becomes a mother and interacts with her own child during early sensitive periods for social-emotional development (0–4 years old, Cicchetti et al., 1991). Similarly, we wanted to know if such a mother might have difficulty with her ability to take her child's perspective with respect to emotional comprehension in order to be able to provide sensitive responsiveness to the child's emotional communication that allows the development of emotional comprehension in her child. This difficulty may become particularly salient when the young child's affective communication – for example, of fear or anger, resonates with the mother's trauma-associated memory trace such that her autonomic nervous system is activated and she is unable to empathize with her child's emotional state (Porges, 2007; Sanders, Rackers, & Kimmel, 2019; Schechter, Moser, McCaw, & Myers, 2014). Studies suggest that problematic development of a child's capacity for emotional comprehension (Laurent, Hecht, Ensink, & Borelli, 2020) as well as for Mentalization, which is the ability to infer mental states in self and other with respect to intention and action is associated with significant risk for child emotional dysregulation and related psychopathology (Ensink, Bégin, Normandin, & Fonagy, 2017). A prereq uisite for Mentalization is emotional comprehension (Fonagy, 1996).

A review of the literature supported that despite these findings, no published study to date has examined possible associations between emotional comprehension among traumatized mothers and their children and child psychopathology.

In the present study, we considered a longitudinal sample including mothers exposed to interpersonal violence (IPV), who suffered from related PTSD. This clinical sample was compared with a group that combined mothers who had experienced IPV without PTSD and mothers with neither IPV history nor any other kind of PTSD. We met mothers and their children at a first time point when children were aged 12–42 months (Phase 1), thus corresponding to the early sensitive periods for social-emotional development previously described. We then administered a well-validated emotional comprehension task to test both the traumatized mother's capacity for perspective-taking with respect to her child's emotional comprehension and her child's own emotional comprehension. This was done during a second time-point, when children were aged between 5 and 9 years old (Phase 2), in order to investigate: 1) how maternal IPV-PTSD and/or maternal exposure to violent events during childhood (IPV) might affect the child's emotional comprehension; and 2) mothers' prediction of their own child's emotional comprehension and rating of their child's symptoms and behaviours.

We thus administered the Test of Emotional Comprehension (TEC) (Pons et al., 2004) which investigates children's emotional comprehension ranging from basic understanding (i.e. external causes on emotions) to a deeper, more complex type of understanding (i.e. mixed emotions, possibility of regulating emotions) (Child-TEC). The same test was administered to mothers, however we asked them to respond to the items as they imagined that their child would (mTEC). We acquired the mTEC data for purposes of understanding more about the mother of the child and her relationship with her child than about the child himself/herself.

The goal of assessing mTEC was not thus so much the accuracy of assessment as: 1) to see how well the mother can take her individual child's perspective. In order for a mother to take the perspective of her child, she must be able to evaluate the stimuli from her own vantage point and then imagine how her child's vantage point might differ from hers, taking into account her child's individual personality and developmental capacities. 2) Negative appraisals of child emotional comprehension by the parent (i.e. imagining that the child will not perform well), we hypothesize might be associated with parental psychopathology (Callender, Olson, Choe, & Sameroff, 2012). This has been shown for parental depression but not yet tested for parental PTSD. However, a study related to parent–child trauma has shown that negative parental appraisal of the child's ability to cope following the experience of a potentially traumatic life event impacted the child's development of psychopathology (Hiller et al., 2018).

To our knowledge, investigation of maternal perspective regarding their own child's level of emotional comprehension and its relationship with maternal psychopathology has not been previously investigated.

With respect to previous results obtained by the Geneva Early Childhood Stress Project (GECS-Pro; Moser et al., 2015; Perizzolo et al., 2019) that demonstrated effects of maternal IPV-PTSD on mothers identification and comprehension, as well as child appraisal of emotions using brain imaging, our specific hypotheses were the following:

Hypotheses:

(1) Maternal IPV-PTSD will be associated with poorer child performance in emotional compre hension.
(2) Maternal IPV-PTSD diagnosis will be associated with poorer maternal emotional comprehension (low scores on the mTEC).
(3) Maternal IPV-PTSD diagnosis and lower mTEC scores will be associated with greater anxious/depressed and aggressive behaviour on the maternally reported Child Behaviour Checklist (CBCL).

(4) The combination and interactions of maternal IPV-PTSD diagnosis, poorer maternal emotional comprehension and maternal assessment of child symptoms will be associated with greater depressive and/or ODD symptoms on the clinician-rated Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS).

To our knowledge, no published studies of traumatized parents and their children to date have examined associations between maternal trauma-related psychopathology, maternal-child emotional comprehension, and child psychopathology.

2. Methods

2.1. Participants

This study obtained approval from the Geneva University Hospitals' institutional ethics committee in accordance with the Helsinki Declaration. The Geneva Early Childhood Stress Project (GECS-Pro) of which this study is a part, is a prospective, longitudinal research project, subdivided in two phases, that considers the effects of maternal IPV-PTSD on the early parent–child relationship and formative early development, and on child psychiatric morbidity subsequently. The initial Phase recruited participants when children were 12–42 months old, a sensitive developmental period for emotion regulation. The research team posted recruitment flyers at the Geneva University Hospitals and Faculties and in community centres, domestic violence agencies and shelters, the latter in order to oversample for domestic violence-exposed mothers. Fathers were not included in the study due to the number of mothers living under order of protection and in anonymous shelters.

Mothers and their children were included in GECS-Pro Phase 2 when children were ages 5 to 9-years-old if they already participated in Phase 1. Data were collected from 2010 to 2015. Following informed consent, 64 mother-child dyads participated in Phase 2 out of the original 84 participant dyads in Phase 1 of the GECS-Pro (76% retention). Three dyads were excluded due to mothers having a PTSD diagnosis that was due to reasons other than interpersonal violence. Of the remaining 61 dyads, thirty-six Phase 2 dyads were IPV-PTSD mothers and their young children (mean age = 6.97 years, SD = 1.24, 47% girls) and 26 mothers were non-PTSD controls and their children (mean age = 6.98, SD = 0.98, 44% girls). The groups did not differ significantly in age or sex. The 24% that did not continue from Phase 1 to Phase 2 did not differ from the remaining 76% in terms of parent or child age, child gender, socio-economic status, or number of traumatic life-events.

Mother-child dyads were excluded if participants suffered from a psychotic or autistic spectrum disorder, were physically and/or mentally impaired to participate in the tasks or if mothers self-reported actively abusing substances, those evaluations were made using the Geneva Sociodemographic Questionnaire (GSQ) (Sancho Rossignol et al. unpublished).

2.2. Clinical assessment

2.2.1. Maternal psychopathology

Maternal IPV-PTSD was also assessed during Phase 1 (Schechter et al., 2017) and two groups were created according to the Clinician Administered PTSD Scale (CAPS) and the Posttraumatic Symptom Checklist – Short Version (PCL-S). The CAPS and PCL-S versions administered were compatible with the DSM-IV-TR.

The CAPS assesses lifetime PTSD (Blake et al., 1995) and all CAPS items had Kappa coefficients higher than 0.63; internal consistency for all CAPS items resulted in a Cronbach's alpha coefficient of 0.97 (Pupo et al., 2011).

The PCL-S assesses current PTSD symptoms (Weathers, Keane, & Davidson, 2001) and demonstrates validity and high reliability (Lima, Barreto, & Assunção, 2012). PCLS's Cronbach's alpha coefficients indicated high internal consistency for the total scale (0.91) and for re-experiencing, avoidance, and hyper-arousal symptom clusters as delineated in the DSM-IV (0.83, 0.81, and 0.80). Finally, the PCLS' temporal reliability (test-retest) was high and consistent for different cut-offs.

Mothers who met criteria for DSM-IV-TR PTSD full diagnosis or demonstrated clinically significant symptoms (PCLS score > 25 and CAPS score > 35) were included in the same IPV-PTSD group. They were included regardless of whether maternal IPV-related trauma was due primarily to domestic violence alone (i.e. to physical and/or sexual violence with partner) or with a history of childhood maltreatment and/or family violence exposure. The second group contained non-PTSD mothers with and without trauma exposure(s). Mothers with PTSD due to reasons other than IPV were excluded from analyses.

Maternal depression (rated via the Beck Depression Inventory II- BDI-II; Beck & Steer, 1987) was also assessed during Phase I (when children were 12–42 months old) since major depressive disorder (MDD) is often comorbid with PTSD (Flory & Yehuda, 2015). We controlled for maternal history of depression in our analyses. The two groups were additionally matched for gender and child age. Demographic and clinical characteristics are presented in Tables 1 and 2.

2.2.2. Mothers' childhood histories of violence exposure

Maternal history of maltreatment and violence exposure as a child (i.e. ages 0–16 years) and as an adult were

assessed at Phase 1 via the Brief Physical and Sexual Abuse Questionnaire (BPSAQ; Marshall et al., 1998) and the Traumatic Life Events Questionnaire (TLEQ; (Kubany et al., 2000) to assess other traumatic life events not covered by the BPSAQ Weathers & Keane, 2007). The BPSAQ allows the quantification of maternal violent trauma history severity and was often used in studies considering violence exposure and parenting (Chamberlain et al., 2019; Schechter et al., 2008, 2005, 2011). For purpose of validation, the Violence Exposure Severity Score obtained at the BPSAQ was correlated against the Clinician Administrated PTSD Scale (CAPS), and validity was confirmed ($r = .69$, $p < .001$, Schechter et al., 2005). The TLEQ assesses 22 life events based on the A-Criterion for the DSM-IV diagnosis and test–retest reliability was studied in multiple samples. Temporal stability was consistently good to excellent for items and trauma-types, and excellent for overall high magnitude stressor and persisting posttraumatic distress scores (Kappa coefficients between .60 and .91). Across multiple samples, construct validity was confirmed by findings of strong convergent validity with other standard measures and by correlations of the high magnitude stressor and persisting posttraumatic distress scores with PTSD symptoms (Carlson et al., 2011).

2.2.3. Child violence exposure

At time-point 2, corresponding to Phase 2 of the GECS-Pro, both mothers and children life-events histories were updated via the TLEQ items and the Traumatic Events Screening Inventory-Parent Report Revised (TESI-PRR) (Ford, 2002) completed by mothers. No mothers from the non-PTSD group were exposed to new violent events. Children responded to the clinician-administered Violent Experiences Scale (VEX-R) (Fox & Leavitt, 1995). The VEX-R is 21-item self-report measure administered as an interview to the child about violence exposure, validated for children aged 4–10. The VEX-R includes drawings to accompany questions along with a 4-point thermometer-type rating scale. We paid specific attention to this latter measure as we wondered if children of traumatized mothers would themselves report greater exposure to IPV than children of non-traumatized controls and if the VEX-R might be important in the prediction of child performance on the TEC. We thought it might be important in that if child exposure to violence influenced child performance on the TEC, the relationship would confound that of child TEC performance and maternal PTSD.

2.2.4. Child psychopathology

Child psychopathology as assessed by the mother was measured using CBCL (Achenbach, Achenbach, & Achenbach, 1991). Child psychopathology (number of symptoms) with the child as primary informant and improved through clinical judgement was measured using certain modules of the K-SADS, a semi-structured clinical interview of the child. The CBCL is a well-validated parent-report measure for ages 6–18 and thus may not be free of parental bias in this high-risk population. Indeed, the literature supports the validity of parent report for psychopathology, particularly, externalizing behaviour (Bied, Biederman, & Faraone, 2017). Nevertheless, to compensate for possible parental bias, modules from the K-SADS (K-SADS; Kaufman et al., 1997) were administered to children.

2.2.5. Test of emotion comprehension (TEC)

Finally, both children and mothers were assessed using the Test of Emotion Comprehension (TEC) (Pons & Harris, 2000). The TEC is a picture book containing narratives followed by questions. Each scenario response-set in the TEC contains four possible emotional-story outcomes, often presented as facial expressions of the story-protagonists. The experimenter first introduces the scenario and reads the accompanying story (i.e. 'a rabbit eats his carrot while a fox observes his from behind a shrub. The rabbit does not know that the fox is there') and then children attribute an emotion to the story protagonist by pointing to the most appropriate of the four possible emotions (i.e. How is the rabbit feeling? Is he happy, just alright, angry or scared?").

The TEC items test child's comprehension of emotions and include assessment of no fewer than 9 different components of emotional understanding. The TEC gives an overall level of emotion comprehension score ranging from 0 to 9 by adding up the components answered correctly, and these components can be grouped into three specific levels/subscales of emotion understanding, according to their increasing difficulty:

External
- Recognition of facial expressions of basic emotions,
- Understanding of external causes of emotions,
- Understanding of desire-based emotions,

Mental
- Understanding of belief-based emotions,
- Understanding of the influence of a reminder on present emotional states,
- Understanding of the possibility of hiding emotional states.

Reflective
- Understanding of the possibility to regulate emotional states,
- Understanding of mixed emotions, and
- Understanding of moral self-reflective emotions.

The TEC has demonstrated good test–retest reliability and concurrent, criterion, and construct validity (Pons et al., 2019).

In this study, mothers were instructed to take their child's perspective. They were reminded before administration of each item by the research clinician to answer the question as if they were her own child (mTEC). The research clinician requested that the mother imagine her child's response regardless of whether she herself would give the same response.

2.3. Study protocol

Mothers and children came to the research centre and were greeted by a research clinician who accompanied the dyad to the testing area. Children were seen by one research clinician and mothers by another, in sound-proof interview rooms. The research clinician presented the TEC booklet to the individual participant and read the general instructions aloud. The clinician then read specific instructions for each test item as the test unfolded. Mothers were reminded during general instructions and before answering each item to respond to the item as mother thought that her child would have responded, rather than give her personal response (mTEC). The whole visit duration lasts between 2.5 and 3 hours for both children and mothers, and the emotional comprehension task itself takes around 20 minutes, depending on children.

2.4. Statistical analysis

An SPSS programtogether with SAS 9.3 (SAS Institute, Cary, NC, USA) and JAMOVI 1.6.2.2 (jamovi.org) including Jamovis medmod 1.1. module were used to conduct statistical analyses. Participants with missing data were excluded from the present analysis.

Descriptive statistics described dyad demographics, maternal history of PTSD and abuse, mTEC, and child TEC. Proportions were calculated overall and by maternal phase 1 PTSD status.

Additionally, we investigated associations with child TEC scores. For this investigation, Spearman correlations between child TEC and the following measures were performed: mTEC, child age, socio-economic status, VEX-R scores for child experience of physical violence, and major depression symptom severity scores and maternal IPV-PTSD scores.

2.4.1. Association between maternal life events & test of emotion comprehension

In accordance with hypothesis 1, using Spearman correlation, we tested whether child TEC scores differed between children of mothers with IPV-PTSD and those without.

We investigated whether maternal IPV-PTSD would predict the mTEC score using an ordinal regression. An ordinal regression was chosen since the mTEC and scores were not normally distributed. Prior to performing this analysis, we tested all included scales for

normality via Kolmogorov–Smirnov tests and converted all non-normally distributed scales to ranks.

To control whether other potential predictors might also be important, we applied four other models that tested different combinations of PTSD and categories of childhood exposure (i.e. physical and/or sexual abuse and/or domestic violence) as independent variables. In both the main model and all other models, for illustrative purposes only, we also estimated odds ratios in a binarized regression (IPV-PTSD vs. non-PTSD controls).

In these models, we considered maternal PTSD symptom severity on one hand, but also wanted to add maternal exposure to abuse and domestic violence during childhood to see whether current pathology is sufficient or whether there may be an important factor of developmentally acquired differences explaining the mTEC. Model 1 considered PTSD alone. Model 2 considered childhood exposure to domestic violence only in order to isolate this variable, which is a known risk factor for adult engagement in domestic violence relationships (Schechter & Serpa, 2018); and Model 3 included both PTSD and childhood exposure to domestic violence. In supplementary materials we also performed models including childhood physical and sexual abuse (see supplementary Table S2). These five models thus covered the three principal forms of IPV experienced during childhood: physical abuse, sexual abuse, and exposure to domestic violence.

Adjusted models included the following covariates: Household income, measure of maternal depression at Phase 1, maternal report of domestic violence that may have occurred between Phases 1 and 2, child age, child TEC, child sex and child report of experienced physical violence at phase 2.

2.4.2. Association between maternal test of emotion comprehension & child psychopathology

Given the prior literature, we first focused our child-symptom related analysis on the CBCL subscale scores. To test whether children of mothers with poorer emotional comprehension and more lifetime IPV-PTSD symptoms would show more aggressive behaviour (part of externalizing behaviours) and/or anxious or depressive symptoms (part of internalizing symptoms), we performed two ordinal regressions: one with anxious/depressive behaviours as dependent variable, and the other with aggressive behaviours as the dependent variable.

Given the potential parental bias of the CBCL, we performed additional analyses looking at the psycho-pathological symptoms in children assessed through the number of symptoms on the K-SADS (i.e. a structured clinical interview of the children). The respective models included the mTEC score, maternal lifetime IPV-PTSD symptoms and maternal rating of

child CBCL-scores as well as the two-way interactions as the independent variables, while the number of child psychopathological symptoms was the dependent variable. We considered ODD symptoms, and depression symptoms as dependent variables and performed an ordinal regression model for each of them. For the model with ODD as a dependent variable, the CBCL aggression were included, while for the model with child depression the CBCL anxiety/depression score was used as independent variable in order to ascertain that mothers' ratings of their children were meaningful to actual symptoms and potentially interactive with lifetime PTSD and mTEC. Ordinal regressions were performed given that the underlying distributions were not all normally distributed. All non-binary covariates were converted to ranks and z-standardized prior to inclusion. All regression analysis was performed with two models: Model 1 was unadjusted. In model 2, adjustment was performed for household income, child sex, child age, child TEC score and child self-reported exposure to violence.

We also performed post hoc testing. If adjusted models indicated a factor of adjustment to be important ($p < .05$), we performed a third regression model. This third model used the independent variables from model 1 and added the significant covariates of model 2 as well as their 2-way interactions with the independent variables of model 1.

For interested parties, we also performed the same regression analyses using a difference score for Children's' TEC and mTEC, rather than the mTEC by itself. Results for this can be found as part of supplementary materials (Tables S3 and S4), and are not presented in the main article, as mTEC and children's TEC did not correlate and our focus was on maternal perception rather than maternal accuracy.

3. Results

3.1. Sample description and group differences

Out of the sample of $N = 61$ mothers, 35 mothers-suffered from IPV-PTSD, and 26 did not have PTSD (i.e. controls; Table 1), with all mothers within the PTSD-group having experienced IPV as adults (i.e. physical and/or sexual violence with romantic partner). Out of the 26 without IPV-PTSD, 6 had nevertheless been exposed to some form of violence but did not develop PTSD. Among background variables, more IPV-PTSD mothers were of non-Swiss nationality – generally in the public hospital population implying a history of immigration despite varying degrees of assimilation, and had lower household income than non-PTSD mothers. As one might expect, significantly more IPV-PTSD mothers than non-PTSD controls were physically and/or sexually abused and exposed to domestic violence as a child. Mothers with IPV-PTSD

Table 1. Mother characteristics, overall and by phase 1 maternal PTSD status, Geneva early childhood stress project (GECS-Pro), $n = 61$.

	Full IPV sample population ($n = 61$)		No-PTSD ($n = 25$)		PTSD ($n = 36$)		
Characteristic	N (Mean)	Percent (SD)	N (Mean)	Percent (SD)	N (Mean)	Percent (SD)	P-value[a]
Age, Phase 2, years	(39)	(5)	(41)	(5)	(39)	(6)	0.26
Nationality							
Swiss	34	56	17	68	17	47	0.11
Not Swiss	27	44	8	32	19	53	
Household income (categorized)	(4)	(2)	(4)	(1)	(3)	(2)	0.07
Physical Abuse, Childhood							
No	28	46	13	52	15	42	0.43
Yes	33	54	12	48	21	58	
Sexual Abuse, Childhood							
No	48	79	23	92	25	69	0.03
Yes	13	21	2	8	11	31	
Domestic Violence, Childhood							
No	35	57	20	80	15	42	0.003
Yes	26	43	5	20	21	58	
Any Abuse, Childhood							
No	17	28	10	40	7	19	0.08
Yes	44	72	15	60	29	81	
Depression Score, Phase 1	(9)	(8)	(4)	(5)	(12)	(10)	<0.001
Interpersonal Violence, Phase 2							
No	40	66	20	80	20	56	0.048
Yes	21	34	5	20	16	44	
Mother-responding-as-child-TEC							
External	(3)	(0)	(3)	(1)	(3)	(1)	0.02
Mental	(2)	(1)	(2)	(1)	(2)	(1)	0.10
Reflective	(2)	(1)	(2)	(1)	(1)	(1)	<0.001
Overall	(7)	(2)	(8)	(1)	(6)	(1)	<0.001
Level of Emotion Understanding, Mother-responding-as-child							
Not Low (≥7)	39	63	22	88	17	47	0.001
Low (<7)	22	37	3	12	19	53	

[a]p-Values for the comparison between no maternal PTSD versus maternal PTSD. P-values are in italic. T-tests were used for mean values and Chi Square tests for binary values. Abbreviations: PTSD, post-traumatic stress disorder; SD, standard deviation; TEC, Test of Emotional Comprehension.

that had been diagnosed during Phase 1 of the study when their children were ages 12–42 months, were also significantly more likely to have experienced some form of interpersonal violence between that Phase 1 and Phase 2 (17/38 or 45% vs 4/27 or 15%) ($p = .01$). IPV-PTSD mothers during Phase 1, had significantly more severe depressive symptoms.

Sixty-one children were compared by maternal IPV-PTSD status (Table 2). Contrary to our first hypothesis, children of IPV-PTSD mothers vs of non-PTSD controls did not show significant differences in their performance on the overall TEC and its 3 subscales (all ps>.22) (Table 2). There were no significant group differences with respect to child nationality, age or sex.

Children of mothers with IPV-PTSD did not report having experienced more IPV on the self-report measure of traumatic life-events, the VEX-R during Phase 2 of the study than children of non-PTSD controls (Table 2). TEC overall scores among the children were unaffected by their own experience of IPV as reported on the VEX-R ($p = .6$, data not shown).

IPV-PTSD mothers as compared to non-PTSD controls who were responding as they imagined their child would (Mother-responding-as-child-TEC; mTEC) attributed to their children significantly lower scores of overall emotional comprehension ($p < .001$; mean 8, SD 1 in no-PTSD vs. mean 6, SD 1 in PTSD, see Figure 1). This group difference accounted for a greater difference

Table 2. Child characteristics, overall and by phase 1 maternal PTSD status, Geneva early childhood stress project (GECS-Pro), $n = 61$.

	Full IPV sample population ($n = 61$)		No-PTSD ($n = 25$)		PTSD ($n = 36$)		
			Maternal PTSD, Phase 1				
Characteristic	N (Mean)	Percent (SD)	N (Mean)	Percent (SD)	N (Mean)	Percent (SD)	P-Value[a]
Age, Phase 2, months	(84)	(14)	(84)	(12)	(84)	(15)	0.97
Sex							
Male	33	54	14	56	19	53	0.81
Female	28	46	11	44	17	47	
Nationality							
Swiss	44	72	19	76	25	70	0.57
Not Swiss	17	28	6	24	11	30	
Depression symptoms score: maternal report	(5.1)	(4.6)	(4.2)	(4.0)	(5.7)	(4.9)	0.20
Aggression score: maternal report	(9.1)	(5.3)	(7.5)	(4.4)	(10.1)	(5.7)	0.06
Number of depressive symptoms: clinician report	(1.6)	(1.5)	(1.4)	(1.5)	(1.7)	(1.5)	0.39
Number of oppositional defiant disorder symptoms: clinician report	(0.8)	(1.0)	(0.6)	(1.0)	(1.0)	(1.0)	0.12
Violent Experiences, Score	(15)	(7)	(14)	(6)	(15)	(8)	0.44
Child-TEC							
External	(3)	(1)	(3)	(1)	(3)	(1)	0.22
Mental	(2)	(1)	(2)	(1)	(2)	(1)	0.31
Reflective	(2)	(1)	(2)	(1)	(2)	(1)	0.64
Overall	(7)	(2)	(7)	(1)	(6)	(2)	0.83
Level of Emotion Comprehension							
Not Low (≥7)	33	54	14	56	19	53	0.80
Low (<7)	28	46	11	44	17	47	

[a]p-Values for the comparison between no maternal PTSD versus maternal PTSD. P-values are in italic. T-tests were used for mean values and Chi Square tests for binary values. Abbreviations: PTSD, post-traumatic stress disorder; SD, standard deviation; TEC, Test of Emotional Comprehension.
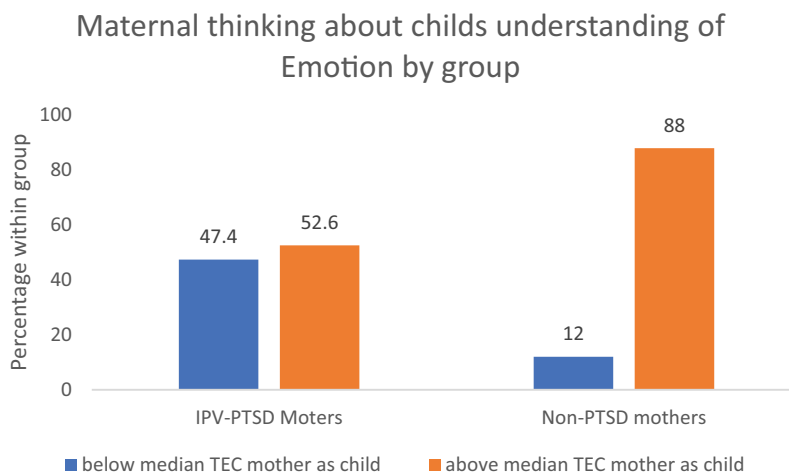
Figure 1. Relationship of mother as a child TEC with maternal PTSD.

between maternal and child scores in the IPV-PTSD group than in the control group.

3.2. Predictors of 'mother-responding-as-child' performance on the TEC

3.2.1. Maternal PTSD as associated with maternal performance on the TEC

Maternal PTSD was a potent predictor of mothers' poorer performance when responding as if she were her child on the TEC, which we interpret as a marker of maternal sensitivity. In the unadjusted model 1, a mother that scored one standard deviation higher on lifetime PTSD symptoms was 2.29 times as likely to have a lower ($p = .001$) score on the TEC when responding as their child than a comparison mother. When adjusting for household income, maternal depression, current IPV, child age, sex and child report of experienced violence, the magnitude of the association increased (OR/SD 2.99, $p = .03$, see Table 3.

3.2.2. Maternal childhood trauma exposure as associated with maternal performance on the TEC

Model 2, indicated that mothers exposed to domestic violence during childhood were significantly more likely to score lower on the mTEC than those without such exposure (model 2 unadjusted OR: 5.23, $p < .001$, adjusted OR 6.60, $p < .001$).

Finally, model 3 demonstrated that maternal PTSD and childhood exposure to domestic violence both contributed independently as predictors of mothers' poorer performance as if she were responding as her child on the TEC (PTSD unadjusted: OR/SD = 1.86, $p = .022$, adjusted OR/SD = 2.22, $p = .036$; childhood domestic violence exposure unadjusted: OR = 3.38, $p = .023$, adjusted OR = 4.48, $p = .014$). Additional models indicated no significant impact of physical and/or sexual abuse on the mTEC (see supplementary Table S2).

3.3. Associations of child emotion comprehension and measures of child pathology

Maternal performance on the TEC, psychopathology and SES, as well as child violence exposure as associated with child performance on the TEC

Spearman correlations between the child TEC and other variables showed no significant correlations for mTEC, nor for maternal symptom severity of PTSD or major depression, nor household income (all $p > .05$). However, child TEC scores did moderately correlate with child age (r = 0.456, $p < .001$). Child violence exposure and child performance on the TEC as measured by the VEX-R was not associated with child TEC scores either ($p > .05$). For overview of univariate correlations of TEC and mTEC with child variables see supplementary Table S1A.

3.4. Associations of maternal performance on the TEC and child psychopathology

We considered the relationship of mother-responding-as-child-TEC and maternal lifetime PTSD symptom severity in combination with 1) maternal report on the CBCL of a) aggressive behaviour, b) child anxious-depressed symptoms, and 2) clinician assessment via the K-SADS of the number of child symptoms with regard to a) child ODD, b) child depression. Results of unadjusted and adjusted models can be found in Table 4.

3.4.1. Regression models related to maternal report of child aggressive behaviours

Concerning maternal report of child aggression, regression models suggested that there was a significant association with the mother-as child TEC score (unadjusted: OR = 2.34, $p = .002$, adjusted: OR = 2.42, $p = .004$) but not maternal IPV-PTSD ($p > .05$). The inverse was true for the regression model on maternal report of child depression/anxiety (mTEC: all $p > .05$, PTSD unadjusted: OR = 1.99, $p = .008$, adjusted: OR = 2.37, $p = .016$). Adjusted analysis suggested that child sex was also associated with maternal report of child anxiety/depression (girls OR = 3.49, $p = .019$), and

Table 3. Unadjusted and adjusted Z-values, *p*-values (significance) and odds ratios (95% confidence intervals) for association between maternal history of PTSD or abuse and mother-responding-as-child emotional comprehension.

	Mother-responding-as-child Overall Emotional Comprehension	
	Unadjusted	Adjusted
Model 1		
PTSD	**OR* = 2.29** (1.40, 3.83) $p < .001$, $X^2 = 11.2$	**OR* = 2.93** (1.47, 6.15) $p = .002$, $X^2 = 9.62$
Model 4		
Domestic Violence	**OR = 5.23** (1.97, 14.7) $p < .001$, $X^2 = 11.3$	**OR = 6.60** (2.14, 21.8) $p < .001$, $X^2 = 11.0$
Model 5		
PTSD	**OR* = 1.86** (1.09, 3.22) $p = .022$, $X^2 = 5.24$	OR* = 2.22 (1.05, 4.85) $p = .036$, $X^2 = 4.39$
Domestic Violence	**OR = 3.38** (1.19, 10.1) $p = .023$, $X^2 = 5.20$	**OR = 4.48** (1.36, 15.6) $p = .014$, $X^2 = 6.07$

Significant odds ratios are bolded. Adjusted models account for maternal depression, maternal IPV since Phase 1 completion, child age, child test of emotion comprehension score and child sex and child experiences of physical violence and household income. *Odds ratios for lifetime PTSD are given for units of 1 standard deviation differences (i.e a odds ratio of 2.29 means that a participant with one standard deviation more PTSD symptoms is 2.29 times as likely to have a lower mother as a child TEC score), all other variables were binary.

PTSD, post-traumatic stress disorder; CI, confidence interval; OR = Odds Ratio.

Table 4. Unadjusted and adjusted Z-values, *p*-values (significance) and odds ratios (95% confidence intervals) for association between mother-responding-as-child emotional comprehension and child symptoms.

	Unadjusted	Adjusted
Child Symptoms Maternal Report		
Model: anxious-depressed		
mTEC	OR[II] = 0.76 (0.46, 1.27), *p* = .297, X^2 = 1.08	OR[II] = 0.89 (0.51, 1.55), *p* = .683, X^2 = 0.14
Maternal IPV-PTSD	OR[II] = 1.99 (1.19, 3.38), *p* = .008, X^2 = 6.99	OR[II] = 2.37 (1.18, 4.81), *p* = .016, X^2 = 5.51
TEC*IPV	OR = 0.77 (0.48, 1.24), *p* = .274, X^2 = 1.20	OR = 0.71 (0.43, 1.14), *p* = .157, X^2 = 2.21
Model: aggressive behaviour		
mTEC	OR[II] = 2.34 (1.36, 4.12), *p* = .002, X^2 = 9.53	OR[II] = 2.42 (1.33, 4.52), *p* = .004, X^2 = 8.20
Maternal IPV	OR[II] = 0.93 (0.55, 1.54), *p* = .773, X^2 = 0.08	OR[II] = 1.16 (0.60, 2.23), *p* = .662, X^2 = 0.18
TEC*IPV	OR = 0.82 (0.50, 1.36), *p* = .441, X^2 = 0.59	OR = 0.78 (0.46, 1.31), *p* = .157, X^2 = −0.94
Child Symptoms Chid/Clinician Report		
Model: Depression Symptoms Disorder		
mTEC	OR[I] = 1.99 (1.17, 3.48), *p* = .010, X^2 = 6.57	OR[I] = 2.55 (1.34, 5.05), *p* = .004, X^2 = 8.29
Maternal IPV-PTSD	OR[II] = 0.71 (0.38, 1.29), *p* = .261, X^2 = 1.26	OR[II] = 0.25 (0.08, 0.65), *p* = .004, X^2 = 8.36
CBCL Depression/Anxiety	OR[II] = 1.33 (0.79, 2.27), *p* = .282, X^2 = 1.16	OR[II] = 1.75 (0.97, 3.29), *p* = .062, X^2 = 3.47
mTEC*IPV	OR = 1.45 (0.82, 2.58), *p* = .197, X^2 = 1.66	OR = 1.36 (0.71, 2.58), *p* = .344, X^2 = 0.90
mTEC*CBCL	OR = 0.71 (0.40, 1.24), *p* = .227, X^2 = 1.45	OR = 0.67 (0.33, 1.33), *p* = .247, X^2 = 1.34
Maternal IPV-PTSD*CBCL	OR = 2.29 (1.28, 4.23), *p* = .005, X^2 = 7.83	OR = 3.77 (1.70, 9.03), *p* < .001, X^2 = 11.05
Model: Oppositional Defiant Disorder		
mTEC	OR[I] = 0.43 (0.17, 0.93), *p* = .031, X^2 = 4.65	OR[I] = 0.27 (0.09, 0.72), *p* = .007, X^2 = 7.20
Maternal IPV-PTSD	OR[II] = 2.34 (1.18, 5.23), *p* = .014, X^2 = 6.08	OR[II] = 3.26 (1.34, 8.76), *p* = .009, X^2 = 6.87
CBCL Aggression	OR[II] = 2.13 (1.11, 4.39), *p* = .022, X^2 = 5.26	OR[II] = 2.28 (1.01, 5.78), *p* = .046, X^2 = 3.98
mTEC*IPV	OR = 1.70 (0.87, 3.40), *p* = .119, X^2 = 2.43	OR = 1.86 (0.85, 4.15), *p* = .116, X^2 = 2.46
mTEC*CBCL	OR = 2.11 (1.11, 4.37), *p* = .023, X^2 = 5.17	OR = 3.66 (1.62, 9.68), *p* = .001, X^2 = 10.4
Maternal IPV-PTSD*CBCL	OR = 0.76 (0.35, 1.57), *p* = .455, X^2 = 0.56	OR = 0.75 (0.31, 1.71), *p* = .489, X^2 = 0.48

Unadjusted models have the symptoms as dependent variables and mother-responding-as-child TEC, maternal lifetime PTSD and -where applicable- maternal report of symptoms- as well as the two way-interactions of those variables as independent variables of ordinal regressions. Adjusted models further adjust for maternal depression, maternal IPV since Phase 1 completion, child age, child sex, child TEC, child experiences of physical violence and household income. [I] Odds for mTEC are given in standard deviations, and inversed. i.e. an odds ration of 1.3 means that a Dyad with a mother of a TEC score 1 standard deviation lower is 1.3 times as likely to have higher child symptoms than a comparison dyad. [II] Odds for symptoms are given for units of 1 standard deviation differences.
IPV-PTSD, Interpersonal violence related post-traumatic stress disorder; CI, confidence interval; CBCL: Child Behaviour Check List; mTEC: Mother as child test of emotion comprehension; OR = Odds Ratio.

post hoc analysis suggested that this may also be the case for the interaction of child sex with both mTEC (OR = 0.26, *p* = .018 and maternal IPV-PTSD (OR = 5.74, *p* = .006).

3.4.2. Regression models related to clinician assessment of child depressive symptoms

Concerning clinician assessed depression symptoms, regression models indicated that these were inversely associated with the mTEC (Reduced mTEC: OR per standard deviation = 1.99, *p* = .010, adjusted OR = 2.55, *p* = .004), as well as with an interaction of Maternal IPV-PTSD and maternal assessment of child symptoms (OR = 2.29, *p* = .005, adjusted OR = 3.76, *p* < .001). Plotting of the respective effects indicated that the mTEC was generally negatively associated with clinician reported child symptoms (see Figure 2(a)). Furthermore, when children actually had any clinician-reported symptoms of major depression, then the variables of maternal PTSD and maternal report of child
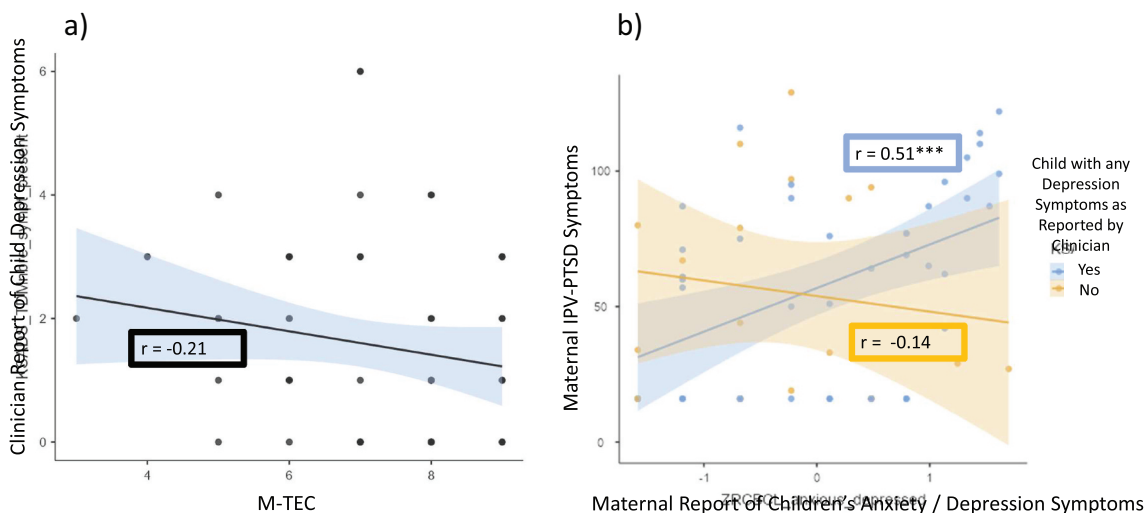
Figure 2. Selected scatter plots related to children's depression symptoms as reported by the clinician. Abbreviations: M-TEC: Mother as child Test of emotion comprehension.

symptoms on the CBCL were positively associated with those depressive symptoms, which was not the case when no clinician assessed symptoms were present (see Figure 2(b)). Adjusted and post hoc models further indicated that VEX-R scores (OR: 2.16 for each additional standard deviation more, *p* = .005) were also associated with child symptoms, but none of interactions with the VEX-R exerted any significant influence on child depression symptoms.

3.4.3. Regression models related to clinician assessment of child oppositional-defiant disorder (ODD) symptoms

Concerning clinician-assessed ODD symptoms, all three independent variables had significant main effects (reduced mTEC: OR = 0.48, *p* = .031, adjusted: OR = 0.28, *p* = .007; maternal IPV-PTSD: OR = 2.34, *p* = .014, adjusted: OR = 3.26, *p* = .009; CBCL aggressive: OR = 2.13, *p* = .022, adjusted: OR = 2.29, *p* = .046). The interaction between the mTEC and maternal report of child aggressive symptoms was also significant (OR = 2.11, *p* = .023; adjusted: OR = 3.66, *p* = .001). Plotting of the respective effects indicated that among children that did show maternally assessed aggression symptoms, the mTEC and maternally reported child symptoms appeared to associate positively, while no such association appeared apparent among children for whom reported ODD symptoms as assessed by the mother (see Figure 3(a)). Similarly, among mothers who had low mTEC, clinician and maternal report of aggression symptoms correlated, while this was not the case for mothers with high mTEC (see Figure 3(b)). Adjusted and post hoc models further indicated that child age (OR = 2.06 for each year younger, *p* = .028) and VEX-R scores (OR: 1.52 for each additional standard deviation, *p* = .001) were also associated with child symptoms, and

that VEX scores and mTEC scores may also interact significantly (OR = 0.32, *p* = .001). For overview of univariate correlations of TEC and mTEC with maternal variables see supplementary Table S1B.

4. Discussion

This study supported the hypothesis that mothers with IPV-PTSD, namely those mothers who had experienced interpersonal violence and suffered from consequent PTSD, performed significantly less well than non-PTSD controls when asked to respond to TEC items as they imagined their own child would respond; they tend to underestimate their child's capacity for emotional comprehension, whereas the mothers who do not suffer from clinically significant PTSD symptoms tend to overestimate their children's capacity (Pons et al., 2004).

We consider it clinically relevant that PTSD mothers as compared to non-PTSD mothers, answered with less EC when imagining what their child would respond on the TEC. One possible reason for this association is that the majority of mothers with IPV-PTSD experienced child physical and/or sexual abuse and/or domestic violence exposure during their own childhood, most often by their primary attachment figures (Moser et al., 2019; Schechter et al., 2015). Therefore, it is likely that in such adverse caregiving environments, mothers did not experience sufficiently adequate models of parental emotional comprehension or parental Mentalization (i.e. operationalized as reflective functioning) during formative social-emotional development thus leading to emotion processing difficulty (Beeghly & Cicchetti, 1994; Marusak, Martin, Etkin, & Thomason, 2015). An alternative interpretation would be, that non-PTSD mothers tend to have a healthy optimistically biased view of their children's emotional comprehension
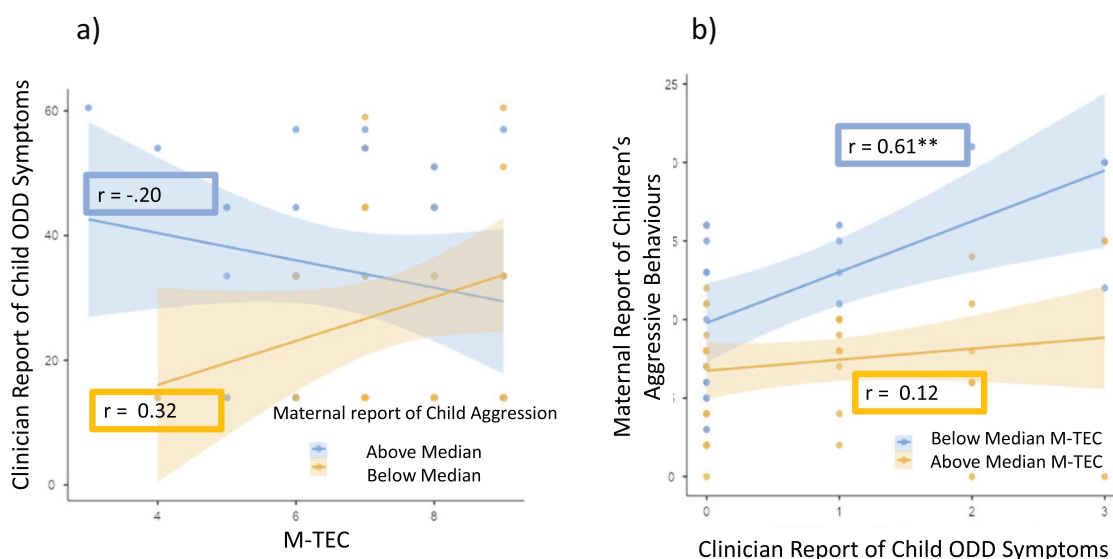
Figure 3. Selected scatter plots related to children's oppositional defiance symptoms as reported by the clinician. Abbreviations: M-TEC: Mother as child Test of emotion comprehension, ODD: Oppositional Defiant disorder.

(they see their children's emotional understanding as better than it really is), and that mothers with IPV-PTSD tend to lack said optimism. This in turn may be at the source of unresponsive or overly controlling mothering styles (Moser et al., 2015; Schechter et al., 2015). Further research is needed to test if mothers' difficulty in this regard is, in the present study sample, ore generalized to all emotional comprehension versus more specifically restricted to perspective-taking with their children. In either case, implications for intervention involve helping mothers both with emotional comprehension skills and perspective-taking. We suggest that intervention address both the likely generalized difficulty with EC and the more specific difficulty of taking the child's perspective with developmental age and individual characteristics taken into account.

In support of the more generalized impairment among PTSD mothers, several studies have shown that adults with PTSD more specifically are significantly more likely to show difficulty in identifying emotions than non-traumatized controls generally (Freeman, Hart, Kimbrell, & Ross, 2009; Moser et al., 2015). An additional study showed that adults suffering from PTSD may have particular trouble with emotion recognition particularly when a facial expression is placed in an incongruent context, suggesting that affected individuals have a different way of processing emotional information (Williams, Milanak, Judah, & Berenbaum, 2018). Yet another study using eye-tracking showed that anxious avoidance of facial stimuli may account for this difference in emotional processing (Milanak, Judah, Berenbaum, Kramer, & Neider, 2018). Indeed, fear does seem to affect one's capacity to comprehend and respond sensitively to emotional communication (Lyons-Ruth, Bronfman, & Parsons, 1999).

One additional measure that is related to the security of attachment, emotional comprehension and perspective- taking is that of mentalization, which is operationalized as reflective functioning and can be applied to supplement measures of caregiving quality (Slade, 2005). Accuracy of parental mentalization is one determinant of children's emotion understanding (Karstad, Wichstrøm, Reinfjell, Belsky, & Berg-Nielsen, 2015). It was also demonstrated that traumatized mothers displayed poorer parental reflective functioning than non-traumatized controls (Borelli et al., 2019; Suardi et al., 2018).

Our study did not support, however, the hypothesis that the children of traumatized mothers would perform more poorly than the children of non-traumatized controls. This is likely due to the wide age-range in our sample, seeing as age correlated with child TEC scores. It seems likely that child age is a more important factor in the development of EC than maternal pathology, which is not to say that maternal pathology is not important too. By school-age, multiple influences have likely already impacted the child's ability to understand emotion such that the effect of maternal difficulty in understanding emotional communication and in taking a child's perspective is likely diluted over time in the context of other important relationships among most of the children. This possible dilution in addition to the relatively small sample size of the present study and the wide age-range of the children could also explain why we did not find differences in emotional comprehension between the children of traumatized mothers and non-traumatized controls at this level of analysis. An alternative explanation of the findings, which would require further study, is that PTSD was not present in the majority of children within the group that had IPV-PTSD mothers, thus differentiating from their mothers. It may be that PTSD among other forms of psychopathology is an important contributing factor if not prerequisite to difficulties in emotional comprehension.

Despite that poorer maternal performance on the TEC (mTEC) was not associated with poorer child performance on the TEC, this does not mean that the children of IPV-PTSD mothers who did not rate their children as highly as non-PTSD mothers did not have more difficulties in other domains. Importantly, our analyses revealed that fewer correct responses on the mTEC (i.e. lower levels of perspective taking) were associated with increased child psychopathology on maternal self-report measures with respect to the perception of aggressive behaviours but not child depressive symptoms. Additional post hoc modelling indicated that when accounting for these maternal report's interactions, maternal understanding of her child's emotion comprehension interacted with the effect of maternal IPV-PTSD symptoms on clinician-rated child ODD symptoms. Similarly modelling indicated that this maternal report in turn moderated the maternal IPV-PTSD effect on clinician-rated child depression symptoms, and that once this was accounted for maternal understanding of her child's emotion comprehension was associated with the effect of maternal IPV-PTSD symptoms on child depression symptoms.

Anxious and depressed mothers have previously been found to report greater number and/or different types of symptoms than their children endorse (Briggs-Gowan, Carter, & Schwab-Stone, 1996). The differences found in the present study between maternal vs clinician-rated child report are consistent with the literature (Berg-Nielsen, Vika, & Dahl, 2003; Gartstein, Bridgett, Dishion, & Kaufman, 2009; Hein et al., 2018). Of interest, the combination of lower mTEC scores and greater maternal report of child aggressive behaviours among mothers with IPV-PTSD may support our previously published observations that these mothers tend to perceive their children negatively and incompatibly with the children's age (Schechter et al., 2015, 2006). Similarly, the literature supports that mothers with emotional difficulties tend to over-report child

behaviour problems and underreport child internalizing symptoms particularly among boys compared to girls (Briggs-Gowan et al., 1996; Najman et al., 2001). Moreover, IPV-PTSD mothers may misinterpret child irritability in the context of depression with oppositional behaviour (Barry, Dunlap, Cotten, Lochman, & Wells, 2005).

Finally, it is of interest that maternal history of childhood exposure to domestic violence was significantly associated with her performance on the mTEC, whereas child physical and sexual abuse during childhood were not associated at this level of analysis (see Table 3 and Supplementary Tables S1 and S2). A possible explanation of this finding is that maternal exposure to domestic violence is a potent predictor of subsequent involvement in domestic violence relationships during adulthood, including with the child's father (Iverson, Jimenez, Harrington, & Resick, 2011; Messinger, Kurdyla, & Guadalupe-Diaz, 2021). Thus, it is possible that mothers with this history who develop IPV-PTSD have a tendency to see their child whose father has been violent in an even more negative and distorted way, particularly if the child is a boy (Briggs-Gowan et al., 2019; Dalal, Lawoko, & Jansson, 2010).

In conclusion, given that maternal emotional comprehension is an important component of caregiving, this study has demonstrated that maternal experience of IPV, and related PTSD contribute to significantly poorer maternal emotional comprehension that is related to a perceived increase in child aggression by these mothers.

Intervention with similarly affected mothers that targets emotional comprehension *and* perspective-taking using tasks similar to those that compose the TEC may well be helpful in increasing sensitive caregiving. Similarly, such intervention may reduce externalizing behaviour (i.e. behaviour associated with PTSD and/or depressive irritability) and mood and anxiety symptoms that are linked to underlying child PTSD and/or depression. The latter may be a response to a disruption in maternal-child mutual regulation during sensitive periods of early development (Moser et al., 2015). Yet, that being said, the children of traumatized mothers by the time they reached school-age did manage to acquire sufficient emotional comprehension skills to perform as controls did on the TEC. Several prior studies have shown that children of mothers with PTSD tend to have both more externalizing *and* internalizing symptoms (Greene, Chan, McCarthy, Wakschlag, & Briggs-Gowan, 2018; Suardi et al., 2018). The present study supports those prior observations.

There are several limitations to the present study. The absence of a concurrent measure of mothers responding to TEC items for herself – from her own perspective, prevents us from being sure that traumatized mothers' poorer performance on responding to the TEC as they expected their child would respond, was not due to a more fundamental, generalized difficulty in emotional comprehension among traumatized mothers. It is possible that the mothers with PTSD had greater difficulty with the task itself as compared to those mothers without PTSD – and thus would have had even if answering 'as-themselves.' This alternative interpretation is thus distinguished from the notion that the traumatized mothers had a more specific difficulty in imagining how in responding how their child would have responded (i.e. in putting themselves in their child's place). We acknowledge this limitation of not having included an additional task whereby mothers would respond as themselves. However, we note that adult mothers with pathology not having enough EC to be able to answer at an average 7- or 8-year-old level seems unlikely, given the correlation of age and TEC values among the children. Finally, the present study did not find direct group differences concerning child outcome measures. In absence of bigger samples this may complicate assessment of clinical implications of maternal PTSD on childhood pathology. One could consider that this indicates that relationships are complex and need to take into account not only categorical maternal pathology but do necessitate the interactions with maternal perception being considered to arrive at increased risk for child pathology. It can therefore not be excluded that non-findings on maternal experience of abuse during childhood may in this sense have to do with their binary assessment.

The absence of data about fathers' and other attachment figures' performance on the TEC limits the possibility of understanding of potential predictors of child performance on the TEC. We thus cannot rule out the possibility that children of mothers suffering from PTSD and comorbid psychopathology might seek or be provided with more social-emotional support from other potential attachment figures and/or mentors in their environment. Finally, because of the limited sample size, adjustments for a high number of factors and particularly for post-hoc tests may have potentially have led to increased variance inflation and overfitting, wherefore post hoc results need to be interpreted with caution.

The retrospective measurement of maternal and child life events and related psychopathology is a limitation, although the establishment of convergent group differences between those mothers classified as traumatized versus non-traumatized controls supports the general validity of the method. Moreover, the findings of this study cannot be generalized to mothers who suffer PTSD related to non-violent and/or single-incident trauma. Finally, 6 mothers in the non-PTSD control group had been nevertheless exposed to some form of violence but did not develop PTSD symptoms, which may have had effects, but as a group

was too small to support meaningful statistical analysis.

The present study has several clinical implications. One implication points to the benefit of systematically assessing maternal-child psychopathology and emotional comprehension in families in which parents and/or children may have experienced interpersonal violent trauma. In terms of emotion comprehension, children from families in which mothers suffered from IPV-PTSD in this study did not differ by the time they reached school-age when compared to children from families with non-PTSD mothers. This study did find, nevertheless, that maternal emotional comprehension and, by definition, perspective-taking are compromised in the maternal IPV-PTSD group versus controls, and that this compromised emotional comprehension and perspective-taking are associated with increased child psychopathology in the form of increased aggressive symptoms by maternal report and increased depressive symptoms by clinician assessment. The absence of findings of a difference in child emotional comprehension between children of IPV-PTSD vs non-PTSD mothers may indicate a hypervigilance to the emotional state of others or may be due as analyses showed, to a confounder of child-age that varied quite a bit within the groups in the context of a relatively modest sample size. And yet, despite these negative findings with respect to differences in child emotion comprehension as we had hypothesized and the apparent resilience within respect to that measure, the study found that the children in the maternal IPV-PTSD group, whose mothers fared less well on the mTEC, have more psychopathology both by maternal report and by clinician assessment based on child interviews. Clinical intervention in this latter population should focus on improving both a mother's emotional comprehension and perspective-taking, as well as addressing negative and distorted perceptions of her child, in the interest of increasing maternal sensitivity and maximizing his/her social-emotional and cognitive development.

Acknowledgments

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

ORCID

J. Glaus http://orcid.org/0000-0001-8883-9473
C. R. Stein http://orcid.org/0000-0002-5866-0250
Dominik A. Moser http://orcid.org/0000-0001-7119-1033
D. S. Schechter http://orcid.org/0000-0003-1663-6305

Data availability statement

The authors confirm that the data supporting the findings of this study are available publicly (https://zenodo.org/record/5180272).

References

Achenbach, T., Achenbach, T., & Achenbach, T. (1991). *Integrative guide to the 1991 CBCL/4-18, YSR, and TRF profiles*. Burlington, VT: Department of Psychology, University of Vermont.

Bailey, H. N., Moran, G., & Pederson, D. R. (2007). Childhood maltreatment, complex trauma symptoms, and unresolved attachment in an at-risk sample of adolescent mothers. *Attachment & Human Development*, 9 (2), 139–161. doi:10.1080/14616730701349721

Barry, T. D., Dunlap, S. T., Cotten, S. J., Lochman, J. E., & Wells, K. C. (2005). The influence of maternal stress and distress on disruptive behavior problems in boys. *Journal of the American Academy of Child and Adol-escent Psychiatry*, 44(3), 265–273. doi:10.1097/00004583-200503000-00011

Beck, A., & Steer, R. (1987). *The revised beck depression inventory*. San Antonio, TX: Psychological Corporation.

Beeghly, M., & Cicchetti, D. (1994). Child maltreatment, attachment, and the self system - Emergence of an internal state lexicon in toddlers at high social risk. *Development and Psychopathology*, 6(1), 5–30. doi:10.1017/S0954 57940000585X

Berg-Nielsen, T. S., Vika, A., & Dahl, A. A. (2003). When adolescents disagree with their mothers: CBCL-YSR discrepancies related to maternal depression and adolescent self-esteem. *Child: Care, Health and Development*, 29(3), 207–213. doi:10.1046/j.1365-2214.2003.00332.x

Bied, A., Biederman, J., & Faraone, S. (2017). Parent-based diagnosis of ADHD is as accurate as a teacher-based diagnosis of ADHD. *Postgrad Med*, 129(3), 375–381. doi:10.1080/00325481.2017.1288064

Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S., & Keane, T. M. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress*, 8(1), 75–90. doi:10.1002/jts.2490080106

Borelli, J. L., Brugnera, A., Zarbo, C., Rabboni, M., Bondi, E., Tasca, G. A., & Compare, A. (2019). Attachment comes of age: Adolescents' narrative coherence and reflective functioning predict well-being in emerging adulthood. *Attachment & Human Development*, 21(4), 332–351. doi:10.1080/14616734.2018.1479870

Briggs-Gowan, M. J., Carter, A. S., & Schwab-Stone, M. (1996). Discrepancies among mother, child, and teacher reports: Examining the contributions of maternal depression and anxiety. *Journal of Abnormal Child Psychology*, 24(6), 749–765. doi:10.1007/BF01664738

Briggs-Gowan, M. J., Estabrook, R., Henry, D., Grasso, D. G., Burns, J., McCarthy, K. J., & Wakschlag, L. S. (2019). Parsing dimensions of family violence exposure in early childhood: Shared and specific contributions to emergent

psychopathology and impairment. *Child Abuse & Neglect*, *87*, 100–111. doi:10.1016/j.chiabu.2018.06.006

Calkins, S. D. (1994). Origins and outcomes of individual differences in emotion regulation. *Monographs of the Society for Research in Child Development*, *59*(2–3), 53–72. doi:10.1111/j.1540-5834.1994.tb01277.x

Callender, K. A., Olson, S. L., Choe, D. E., & Sameroff, A. J. (2012). The effects of parental depressive symptoms, appraisals, and physical punishment on later child externalizing behavior. *Journal of Abnormal Child Psychology*, *40*(3), 471–483. doi:10.1007/s10802-011-9572-9

Carlson, E. B., Smith, S. R., Palmieri, P. A., Dalenberg, C., Ruzek, J. I., Kimerling, R., & Spain, D. A. (2011). Development and validation of a brief self-report measure of trauma exposure: The Trauma History Screen. *Psychological Assessment*, *23* (2), 463. doi:10.1037/a0022294

Chamberlain, C., Gee, G., Harfield, S., Campbell, S., Brennan, S., Clark, Y., . . . Federici, S. (2019). Parenting after a history of childhood maltreatment: A scoping review and map of evidence in the perinatal period. *PLoS One*, *14* (3), e0213460. doi:10.1371/journal.pone.0213460

Cicchetti, D., Ganiban, J., & Barnett, D. (1991). *Contributions from the study of high-risk populations to understanding the development of emotion regulation*. New York: Cambridge University Press. https://doi.org/10.1017/CBO9780511663963.003

Dalal, K., Lawoko, S., & Jansson, B. (2010). The relationship between intimate partner violence and maternal practices to correct child behavior: A study on women in Egypt. *Journal of Injury and Violence Research*, *2*(1), 25–33. doi:10.5249/jivr.v2i1.17

Ensink, K., Bégin, M., Normandin, L., & Fonagy, P. (2017). Parental reflective functioning as a moderator of child internalizing difficulties in the context of child sexual abuse. *Psychiatry Research*, *257*, 361–366. doi:10.1016/j.psychres.2017.07.051

Flory, J. D., & Yehuda, R. (2015). Comorbidity between post-traumatic stress disorder and major depressive disorder: Alternative explanations and treatment considerations. *Dialogues Clin Neurosci*, *17*(2), 141–150.

Fonagy, P. (1996). The significance of the development of metacognitive control over mental representations in parenting and infant development. *Journal of Clinical Psychoanalysis*, *5*(1), 67–86.

Ford, J., *Traumatic Events Screening Inventory-Parent report revised (TESI)*. Unpublished manuscript. Storrs, CT: University of Connecticut, 2002.

Fox, N., & Leavitt, L. (1995). *The violence exposure scale for children-revised (VEX-R)*. College Park, MD: University of Maryland.

Freeman, T. W., Hart, J., Kimbrell, T., & Ross, E. D. (2009). Comprehension of affective prosody in veterans with chronic posttraumatic stress disorder. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *21*(1), 52–58. doi:10.1176/jnp.2009.21.1.52

Gartstein, M. A., Bridgett, D. J., Dishion, T. J., & Kaufman, N. K. (2009). Depressed mood and maternal report of child behavior problems: Another look at the depression–distortion hypothesis. *Journal of Applied Developmental Psychology*, *30*(2), 149–160. doi:10.1016/j.appdev.2008.12.001

Gergely, G., & Watson, J. S. (1996). The social biofeedback theory of parental affect-mirroring: The development of emotional self-awareness and self-control in infancy. *The International Journal of Psycho-analysis*, *77*(Pt 6), 1181–1212.

Greene, C. A., Chan, G., McCarthy, K. J., Wakschlag, L. S., & Briggs-Gowan, M. J. (2018). Psychological and physical intimate partner violence and young children's mental health: The role of maternal posttraumatic stress symptoms and parenting behaviors. *Child Abuse & Neglect*, *77*, 168–179. doi:10.1016/j.chiabu.2018.01.012

Hein, S., Stone, L., Tan, M., Barbot, B., Luthar, S. S., & Grigorenko, E. L. (2018). Child internalizing problems and mother–child discrepancies in maternal rejection: Evidence for bidirectional associations. *Journal of Family Psychology*, *32*(2), 229. doi:10.1037/fam0000358

Hiller, R. M., Meiser-Stedman, R., Lobo, S., Creswell, C., Fearon, P., Ehlers, A., & Halligan, S. L. (2018). A longitudinal investigation of the role of parental responses in predicting children's post-traumatic distress. *Journal of Child Psychology and Psychiatry*, *59*(7), 781–789. doi:10.1111/jcpp.12846

Iverson, K. M., Jimenez, S., Harrington, K. M., & Resick, P. A. (2011). The contribution of childhood family violence on later intimate partner violence among robbery victims. *Violence and Victims*, *26*(1), 73–87. doi:10.1891/0886-6708.26.1.73

Karstad, S. B., Wichstrøm, L., Reinfjell, T., Belsky, J., & Berg-Nielsen, T. S. (2015). What enhances the development of emotion understanding in young children? A longitudinal study of interpersonal predictors. *British Journal of Developmental Psychology*, *33*(3), 340–354. doi:10.1111/bjdp.12095

Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., . . . Ryan, N. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(7), 980–988. doi:10.1097/00004583-199707000-00021

Kubany, E. S., Haynes, S. N., Leisen, M. B., Owens, J. A., Kaplan, A. S., Watson, S. B., & Burns, K. (2000). Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: The traumatic life events questionnaire. *Psychological Assessment*, *12*(2), 210–224. doi:10.1037/1040-3590.12.2.210

Laurent, G., Hecht, H. K., Ensink, K., & Borelli, J. L. (2020). Emotional understanding, aggression, and social functioning among preschoolers. *American Journal of Orthopsychiatry*, *90*(1), 9–21. doi:10.1037/ort0000377

Lima, E. D. P., Barreto, S. M., & Assunção, A. Á. (2012). Factor structure, internal consistency and reliability of the post-traumatic stress disorder checklist (PCL): An exploratory study. *Trends in Psychiatry and Psychotherapy*, *34*(4), 215–222. doi:10.1590/S2237-60892012000400007

Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). *Atypical attachment in infancy and early childhood among children at developmental risk. IV*. Maternal *frightened, frightening, or atypical behavior and disorganized infant attachment patterns. Monographs of the Society for Research in Child Development*, *64*(3), 67–96. discussion 213-20. doi:10.1111/1540-5834.00034

Marshall, R. D., Schneier, F. R., Fallon, B. A., Knight, C. B. G., Abbate, L. A., Goetz, D., & Liebowitz, M. R. (1998). An open trial of paroxetine in patients with noncombat-related, chronic posttraumatic stress disorder. *Journal of Clinical Psychopharmacology*, *18*(1), 10–18. doi:10.1097/00004714-199802000-00003

Marusak, H. A., Martin, K. R., Etkin, A., & Thomason, M. E. (2015). Childhood trauma exposure disrupts the automatic regulation of emotional processing. *Neuropsychopharmacology*, *40*(5), 1250–1258. doi:10.1038/npp.2014.311

Messinger, A. M., Kurdyla, V., & Guadalupe-Diaz, X. L. (2021). Intimate partner violence help-seeking in the U.S. Transgender survey. *Journal of Homosexuality*, 1–25. doi:10.1080/00918369.2021.1901506

Milanak, M. E., Judah, M. R., Berenbaum, H., Kramer, A. F., & Neider, M. (2018). PTSD symptoms and overt attention to contextualized emotional faces: Evidence from eye tracking. *Psychiatry Research*, 269, 408–413. doi:10.1016/j.psychres.2018.08.102

Miller-Graff, L. E., & Howell, K. H. (2015). Posttraumatic stress symptom trajectories among children exposed to violence. *Journal of Traumatic Stress*, 28(1), 17–24. doi:10.1002/jts.21989

Moser, D. A., Aue, T., Suardi, F., Manini, A., Sancho Rossignol, A., Cordero, M. I., & Schechter, D. S. (2015). The relation of general socio-emotional processing to parenting specific behavior: A study of mothers with and without posttraumatic stress disorder. *Frontiers in Psychology*, 6, 1575. doi:10.3389/fpsyg.2015.01575

Moser, D. A., Paoloni-Giacobino, A., Stenz, L., Adouan, W., Manini, A., Suardi, F., & Ginsberg, S. D. (2015). BDNF methylation and maternal brain activity in a violence-related sample. *PLoS One*, 10(12), e0143427. doi:10.1371/journal.pone.0143427

Moser, D. A., Suardi, F., Rossignol, A. S., Vital, M., Manini, A., Serpa, S. R., & Schechter, D. S. (2019). Parental reflective functioning correlates to brain activation in response to video-stimuli of mother-child dyads: Links to maternal trauma history and PTSD. *Psychiatry Research: Neuroimaging*, 293, 110985. doi:10.1016/j.pscychresns.2019.09.005

Najman, J. M., Williams, G. M., Nikles, J., Spence, S., Bor, W., O'Callaghan, M., & Shuttlewood, G. J. (2001). Bias influencing maternal reports of child behaviour and emotional state. *Social Psychiatry and Psychiatric Epid-emiology*, 36(4), 186–194. doi:10.1007/s001270170062

Nook, E. C., Stavish, C. M., Sasse, S. F., Lambert, H. K., Mair, P., McLaughlin, K. A., & Somerville, L. H. (2020). Charting the development of emotion comprehension and abstraction from childhood to adulthood using observer-rated and linguistic meas-ures. *Emotion*, 20(5), 773. https://doi.org/10.1037/emo0000609

Perizzolo, V. C., Berchio, C., Moser, D. A., Gomez, C. P., Vital, M., Arnautovic, E., & Schechter, D. S. (2019). EEG recording during an emotional face-matching task in children of mothers with interpersonal violence-related posttraumatic stress disorder. *Psychiatry Research: Neuroimaging*, 283, 34–44. doi:10.1016/j.pscychresns.2018.11.010

Pons, F., Giménez-Dasí, M., Daniel, M.-F., Auriac-Slusarczyk, E., Businaro, N., & Viana, K. (2019). Impact of a low-cost classroom dialogue-based intervention on preschool children's emotion understanding. *European Early Childhood Education Research Journal*, 27(5), 630–646. doi:10.1080/1350293X.2019.1651961

Pons, F., Harris, P. L., & de Rosnay, M. (2004). Emotion comprehension between 3 and 11 years: Developmental periods and hierarchical organization. *European Journal of Developmental Psychology*, 1(2), 127–152. doi:10.1080/17405620344000022

Pons, F., Harris, P. L., & Doudin, P.-A. (2002). Teaching emotion understanding. *European Journal of Psychology of Education*, 17(3), 293. doi:10.1007/BF03173538

Pons, F., & Harris, P. (2000). *Test of emotion comprehension: TEC*. Oxford: University of Oxford.

Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology*, 74(2), 116–143. doi:10.1016/j.biopsycho.2006.06.009

Pupo, M. C., Jorge, M. R., Schoedl, A. F., Bressan, R. A., Andreoli, S. B., Mello, M. F., & Mari, J. D. J. (2011). The accuracy of the clinician-administered PTSD scale (CAPS) to identify PTSD cases in victims of urban violence. *Psychiatry Research*, 185(1–2), 157–160. doi:10.1016/j.psychres.2009.11.006

Sancho Rossignol, A., Luth Faivre, F., Suardi, F., Moser, D. A., Cordero, M., Rusconi Serpa, S., & Schechter, D. S. *Sociodemographic questionnaire (GSQ)*. Unpublished measure.

Sanders, A., Rackers, H., & Kimmel, M. (2019). A role for the microbiome in mother-infant interaction and perinatal depression. *International Review of Psychiatry*, 31(3), 280–294. doi:10.1080/09540261.2018.1548431

Schechter, D. S., Coates, S. W., Kaminer, T., Coots, T., Zeanah, C. H., Davies, M., & Myers, M. M. (2008). Distorted maternal mental representations and atypical behavior in a clinical sample of violence-exposed mothers and their toddlers. *Journal of Trauma & Dissociation*, 9(2), 123–147. doi:10.1080/15299730802045666

Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., & Myers, M. M. (2005). Maternal mental representations of the child in an inner-city clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment & Human Development*, 7(3), 313–331. doi:10.1080/14616730500246011

Schechter, D. S., Moser, D. A., Aue, T., Gex-Fabry, M., Pointet, V. C., Cordero, M. I., … Seedat, S. (2017). Maternal PTSD and corresponding neural activity mediate effects of child exposure to violence on child PTSD symptoms. *PLoS One*, 12(8), e0181066. doi:10.1371/journal.pone.0181066

Schechter, D. S., Moser, D. A., McCaw, J. E., & Myers, M. M. (2014). Autonomic functioning in mothers with interpersonal violence-related posttraumatic stress disorder in response to separation-Reunion. *Developmental Psychobiology*, 56(4), 748–760. doi:10.1002/dev.21144

Schechter, D. S., Moser, D. A., Reliford, A., McCaw, J. E., Coates, S. W., Turner, J. B., … Willheim, E. (2015). Negative and distorted attributions towards child, self, and primary attachment figure among posttraumatically stressed mothers: What changes with clinician assisted videofeedback exposure sessions (CAVES). *Child Psychiatry & Human Development*, 46(1), 10–20. doi:10.1007/s10578-014-0447-5

Schechter, D. S., Myers, M. M., Brunelli, S. A., Coates, S. W., Zeanah, C. H. Jr., Davies, M., & Liebowitz, M. R. (2006). Traumatized mothers can change their minds about their toddlers: Understanding how a novel use of videofeedback supports positive change of maternal attributions. *Infant Mental Health Journal*, 27(5), 429–447. doi:10.1002/imhj.20101

Schechter, D. S., & Serpa, S. R. (2018). *Understanding how traumatised mothers process their toddlers' affective communication under stress: Towards preventive intervention for families at high risk for intergenerational violence, in early parenting and prevention of disorder* (pp. 90–117). London: Routledge.

Schechter, D. S., Suardi, F., Manini, A., Cordero, M. I., Rossignol, A. S., Merminod, G., & Serpa, S. R. (2015). How do maternal PTSD and alexithymia interact to impact maternal behavior? *Child Psychiatry & Human*

Development, *46*(3), 406–417. doi:10.1007/s10578-014-0480-4

Schechter, D. S., Willheim, E., McCaw, J., Turner, J. B., Myers, M. M., & Zeanah, C. H. (2011). The relationship of violent fathers, posttraumatically stressed mothers and symptomatic children in a preschool-age inner-city pediatrics clinic sample. *Journal of Interpersonal Violence*, *26* (18), 3699–3719. doi:10.1177/0886260511403747

Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development*, *7*(3), 1181–1212. doi:10.1080/14616730500245906

Suardi, F., Moser, D. A., Sancho Rossignol, A., Manini, A., Vital, M., Merminod, G., ... Schechter, D. S. (2018). Maternal reflective functioning, interpersonal violence-related posttraumatic stress disorder, and risk for psychopathology in early childhood. *Attachment & Human Development*, 1–21. doi:10.1080/14616734.2018.1555602

Supplee, L. H., Skuban, E. M., Trentacosta, C. J., Shaw, D. S., & Stoltz, E. (2011). Preschool boys' development of emotional self-regulation strategies in a sample at risk for behavior problems. *The Journal of Genetic Psychology*, *172*(2), 95–120. doi:10.1080/00221325.2010.510545

Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-administered PTSD scale: A review of the first ten years of research. *Depression and Anxiety*, *13*(3), 132–156. doi:10.1002/da.1029

Weathers, F. W., & Keane, T. M. (2007). The criterion A problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress*, *20*(2), 10–18. doi:10.1002/jts.20210

Williams, C. L. Milanak, M. E., Judah, M. R., & Berenbaum, H. (2018). The association between PTSD and facial affect recognition. *Psychiatry Research*, *265*, 298–302. doi:10.1016/j.psychres.2018.04.055