

# Theory of mind performance in women with posttraumatic stress disorder related to childhood abuse

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**Objective:** Key questions remain unaddressed concerning the nature of interpersonal functioning in trauma survivors, including the ability to understand and interpret other people's thoughts and feelings. Here, we investigate theory of mind (ToM) performance of women with PTSD related to childhood abuse in comparison to healthy controls.

**Method:** Participants completed two ToM tasks, the Interpersonal Perception Task-15 (IPT-15) and the Reading the Mind in the Eyes Task – Revised (RMET).

**Results:** Relative to controls, women with a history of childhood trauma had difficulty recognizing familial relationships depicted in the IPT-15 ( $P = 0.005$ ). No other category of the IPT-15 showed significant group differences. In addition, while healthy women displayed faster RMET reaction times to emotionally valenced mental states (positive:  $P = 0.003$ ; negative:  $P = 0.016$ ) compared with neutral mental states, the PTSD group showed similar reaction times across all valences. The presence of dissociative symptoms (e.g., disengagement, amnesia, identity dissociation) was strongly associated with hindered accuracy of complex mental state identification and altered perception of kinship interactions.

**Conclusion:** Women with PTSD stemming from childhood trauma show changes in ToM abilities particularly those often involved in the interpretation of family interactions. In addition, individuals with PTSD showed slower reaction times during the recognition of complex mental states from emotionally salient facial/eye expressions in comparison with healthy subjects.

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## Significant outcomes

- Women with posttraumatic stress disorder (PTSD) related to childhood abuse show deficits in theory of mind performance, particularly during interpretations of familial interactions.
- Women with PTSD are slower at recognizing complex mental states from emotionally salient facial/eye expressions in comparison with healthy women.
- The presence of dissociative symptoms is strongly associated with hindered accuracy of complex mental state identification and altered perception of kinship interactions.

## Limitations

- Retrospective nature of self-report measures, modest sample size, and the cross-sectional design are limitations of this study.
- Our findings cannot be generalized to individuals who experienced single-incident trauma, or to individuals exposed to trauma occurring outside of developmentally critical periods.
- Study sample did not include men, therefore limiting the generalizability of these findings only to women.

## Introduction

Posttraumatic stress disorder (PTSD) is an illness that can have debilitating effects on multiple facets of daily living, and in particular on interpersonal relationships (1). Previous work has shown that individuals with PTSD report diminished cohesion and disrupted functioning of the family unit (2), lower life satisfaction (3), disrupted intimacy within romantic attachments (4), and are less likely to form and maintain intimate relationships (5). Furthermore, individuals exposed to childhood trauma display deficits in emotion regulation (6, 7), report disrupted interpersonal functioning (8, 9), and are at higher risk of suicide (9, 10), psychosis (11), and an unfavorable course of illness in mood disorders (12, 13).

Despite strong evidence of disruptions in interpersonal functioning among survivors of trauma, little work has systematically investigated the specific impairments in social cognition, such as theory of mind (ToM) deficits, which may mediate these poor outcomes. ToM is defined as the ability to adopt the perspectives of others to understand their behaviour, intentions, and the emotions they may be experiencing (14). Preliminary work points to alterations in social cognitive performance among patients with PTSD, with the majority of work focused on alterations in empathic responding and in emotion recognition (15). Critically, empathic responding is thought to require ToM abilities as the ability to take another's perspective is required prior to engaging in emotional reciprocity. These findings are in line with numerous studies demonstrating deficits in recognizing facial emotion (e.g., anger, happiness, sadness) among individuals with PTSD (16, 17) (but see (18, 19) for conflicting findings in facial expressivity).

By contrast, ToM performance among patients with PTSD has received little attention in comparison with patients with related (and commonly comorbid) diagnoses of mood disorders (20, 21). Some studies found less accurate judgment of the complex mental states of others based solely on the visual information available from these individuals' eye region (Reading the Mind in the Eyes Task – Revised; RMET) in individuals with PTSD (22), although others have not observed this (15). The results of the latter study, however, remain equivocal due to variable symptom severity and trauma exposure in the study sample (for a recent review see (23)). However, in the Mazza et al. (22) study, group differences were not observed in an adaptation of Happe's Strange Stories, a complex ToM task involving the interpretation of social interactions including white lies, figures of speech, and

irony. Accordingly, evidence suggestive of ToM deficits in PTSD subjects remains preliminary and equivocal to date.

## Aims of the study

To extend previous research concerning theory of mind performance in individuals with posttraumatic stress disorder related to childhood trauma. Given there is a strong association between childhood trauma, disruptions in parent–child relationships, and the negative effect of trauma on psychosocial development, we hypothesized that individuals exposed to trauma during childhood would experience deficits in ToM, particularly in scenarios involving familial interactions. The influence of varying symptom presentation (e.g., the presence of depressive or dissociative symptoms) was also explored.

## Material and methods

### Participants

Fifty-one women were recruited to participate in this study; 31 individuals with a primary diagnosis of current PTSD related to childhood abuse and 20 healthy controls (HC) of similar age. Women with PTSD were recruited by London Health Sciences Centre (LHSC; London, Ontario, Canada) through out-patient programs. The HC subjects were recruited through word of mouth and local advertisements by LHSC and St. Joseph's Healthcare Hamilton (Hamilton, Ontario, Canada). HC participants had no current or lifetime history of psychiatric illness.

Diagnosis of PTSD was confirmed via the Structured Clinical Interview for DSM-IV (SCID) (24). PTSD symptom severity was assessed using the Clinician-Administered PTSD Scale (CAPS) (25), whereas depression symptom severity was measured with the Beck Depression Inventory (BDI) (26). Additionally, all women with PTSD reported moderate-to-severe histories of childhood trauma on the Childhood Trauma Questionnaire (CTQ) (27). Finally, the National Adult Reading Test – Revised (28) was also administered to estimate verbal intelligence quotient (IQ). Please refer to Table 1 for demographic and clinical summaries. Healthy controls were administered the same measures to rule out the presence of subthreshold psychiatric illness and history of childhood maltreatment. The following were the exclusion criteria for all groups: i) substance use-related disorder within the past 6 months as determined by the SCID; ii) lifetime history of substance

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Table 1. Clinical and demographic characteristics of study sample

Characteristic	Control ( <i>n</i> = 20)	PTSD ( <i>n</i> = 31)
	<i>n</i>	<i>n</i>
Sex		
Male	0	0
Female	20	31
	Mean	Mean
Age	35.8(13.2)	42.1 (12.0)
Education	16.5(2.6)	13.8 (2.4)*
Verbal IQ	110.2(9.1)	104.8 (9.7)†
CAPS	0.5(1.6)	79.4 (15.4)*
BDI	2.6(4.4)	31.8 (12.3)*
Childhood trauma questionnaire		
Emotional abuse	6.2(1.6)	18.4 (5.2)*
Physical abuse	5.5(1.1)	12.6 (5.7)*
Sexual abuse	5.0(0.0)	15.2 (7.3)*
Emotional neglect	7.0(1.9)	17.6 (4.9)*
Physical neglect	5.9(1.5)	11.3 (5.4)*
MDI (Total)	34.2(5.8)	74.6 (21.8)*
Disengagement	7.3(2.2)	16.7 (4.0)*
Depersonalization	5.2(0.4)	10.6 (4.9)*
Derealization	5.4(1.6)	11.5 (4.2)*
Emotional constriction	5.5(1.2)	13.2 (5.8)*
Memory disturbance	5.6(1.5)	11.9 (4.5)*
Identity dissociation	5.1(0.5)	10.3 (6.1)*

Values are *n* or mean (standard deviation).

BDI, Beck Depression Inventory; CAPS, Clinician-Administered PTSD Scale; IQ, Intelligence Quotient; MDI, Multiscale Dissociation Inventory; PTSD, posttraumatic stress disorder.

\*Significant group effect ( $P < 0.05$ ).

†Trending group effect ( $P < 0.06$ ).

dependence as measured by the SCID; iii) use of alcohol or illicit psychoactive substance within 48 h of testing; iv) significant medical illness; v) history of head injury with loss of consciousness lasting more than 60 s; and vi) history of neurological disease.

### Social cognition tasks

*Reading the Mind in the Eyes Test – Revised (RMET)*. The RMET (29) is a computer-based behavioural task that quantifies the ability to attribute complex mental states to others and is widely used in ToM investigations (15, 29, 30). In this task, participants are presented with cropped photographs of individuals that only display the eye region. Subsequently, participants are presented with four adjectives and are instructed to choose the one that best describes what the person (in the photograph) might be thinking or feeling. There are 36 different photographs/trials. Reaction times (RT) and accuracy scores were recorded. The trials were also grouped by emotional valence (positive, neutral, and negative) using a method previously established by Lee et al. (30). Since recent literature suggests that performance on the RMET may be partially accounted for by verbal IQ (31), it was

kept as a covariate, despite only a trending difference between groups.

*Interpersonal Perception Task-15 (IPT-15)*. The IPT-15 is a video-based task that provides a valid measure of social perception (32). In this task, participants are presented with fifteen 1-minute video clips depicting various interactions between individuals that are categorized into five domains: kinship, status, competition, deception, and intimacy. After watching each video clip, participants are presented with a multiple-choice question regarding the interaction depicted within each scene. The scenes provide no explicit information pertaining to the question; instead, the participant must pay attention to non-verbal cues to correctly answer each question. For example, one kinship trial includes a conversation between a child and two adults. Based on verbal and non-verbal behaviour of the three characters, the participant must make a decision of which of the two adults is the child's parent. Each question has one correct answer, with potential scores thus ranging between 0 and 3 for each of the five IPT domains. Higher scores on the IPT-15 represent increased ability to correctly interpret social interactions. Participants were also instructed to provide a subjective estimate of their performance.

### Trauma-related assessments

Trauma-related assessments included the Multiscale Dissociation Inventory (MDI) (33) measuring symptoms of dissociation (disengagement – emotional/cognitive separation from one's environment; depersonalization – altered perception of the self; derealization – altered perception of the surroundings; emotional constriction – dampened emotional responsiveness; memory disturbance – inability to recall personal events/amnesia; identity dissociation – experiencing multiple personalities) and the Parental Bonding Instrument (PBI) (34) assessing maternal and paternal parent-child bonding during the first 16 years of life.

### Statistical methods

To examine group differences on the demographic and clinical variables, a two-tailed *t*-test was used. Due to non-normality (Shapiro-Wilk test), group differences on IPT-15 variables were analyzed using the Mann-Whitney *U*-test. Group differences on RMET variables were analyzed using a repeated measures ANCOVA, using diagnosis as a fixed factor and emotional valence (positive, neutral, negative) on the RMET as repeated factor

(covaried for years of education and IQ). Both accuracy and RT (only for correct answers) were analyzed on the RMET. Bonferroni correction was applied for subsequent multiple comparison *t*-tests. Effect sizes were estimated by partial eta-squared ( $\eta^2$ ) and Cohen's *d*.

Partial correlation analysis was conducted within the PTSD group to examine the relation between ToM performance and clinical and demographic variables, controlling for verbal IQ and years of education. Once a correlation between a ToM measure and an omnibus assessment score was identified, further correlations with the assessment's subscales were performed. All correlations were preceded by the Shapiro–Wilk test of normality. Accordingly, Pearson's *r* or Spearman Rho ( $\rho$ ) values were reported (two-tailed;  $\alpha = 0.05$ ).

**Results**

Demographic and clinical variables

Among the demographic variables, the mean years of education differed significantly between women with PTSD and healthy controls (Table 1). Group difference on verbal IQ was trending at  $P = 0.059$ . As expected, the PTSD group had significantly higher scores on all clinical variables (CAPS, BDI, CTQ, and MDI,  $P_s < 0.05$ ).

Group comparisons for performance on theory of mind measures

*Interpersonal perception task-15 performance.* Relative to controls, women with past childhood trauma had difficulties interpreting scenes depicting kinship interactions on the IPT-15 ( $U = 172$ ,  $z = 2.83$   $P = 0.005$ ; Fig. 1). No other category of the IPT-15 showed significant group differences.

There were no group differences in the subjective performance (subj) on the IPT-15.

*Reading the mind in the eyes task performance.* Analyzing the response times on the RMET, we found a significant interaction between emotional valence and diagnosis ( $F(2,86) = 3.44$ ,  $P = 0.037$ ,  $\eta^2 = 0.074$ ; Table 2). Between-group analysis of RMET reaction times yielded no significant differences across all mental state valences. However, while healthy women displayed significantly faster reaction times on positively ( $t(18) = 3.50$ ,  $P = 0.009$ ,  $d = 0.81$ ) and negatively valenced mental states ( $t(18) = 2.67$ ,  $P = 0.048$ ,  $d = 0.72$ ) compared with neutral mental states, women with PTSD showed statistically similar reaction times across all valences (Table 2; although positive compared to neutral trials was trending ( $t(28) = 2.47$ ,  $P = 0.06$ ,  $d = 0.46$ )).

Accuracy of mental state identification was equivalent across women with childhood trauma and matched controls ( $P > 0.05$ ). To explore whether the comparable accuracy scores between patients and controls were associated with increased response latencies in patients, we also ran a repeated-measures ANCOVA while covarying for response times. The null results remained unchanged.

Relation between ToM tasks, dissociation, and depressive symptoms

We found significant associations between ToM performance, dissociation, and depressive symptoms in the PTSD sample (See Table 3). Increased dissociative symptoms (driven by derealization symptoms ( $\rho = -0.42$ ,  $P = 0.028$ )) were related to poorer accuracy of kinship interactions on the IPT

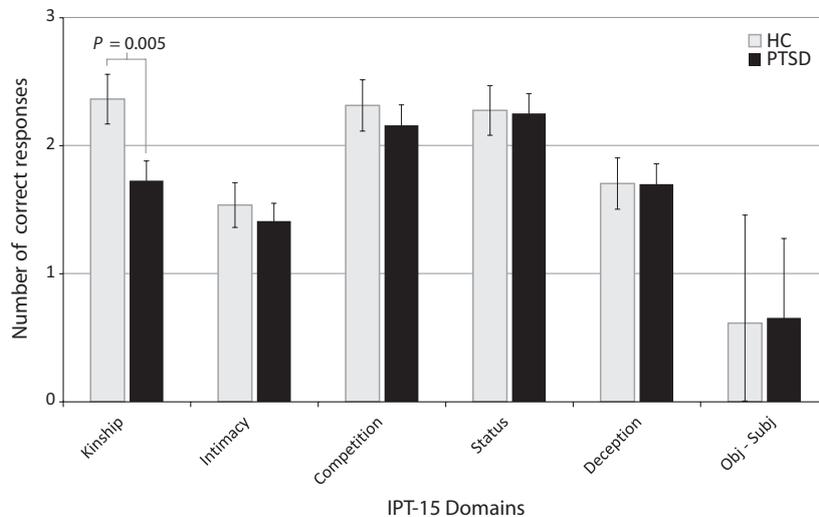


Fig. 1. Mean performance on the Interpersonal Perception Task-15 domains ( $\pm$  st. err.).

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Table 2. Within- and between-group comparisons of reaction times (ms) on the Reading the Mind in the Eyes Task (Bonferroni-adjusted  $P$  values)

	Emotional valence		
	Positive	Neutral	Negative
Within-group sig.	$P = 0.009^{**}$		$P = 0.048^*$
HC [mean (SD)]	9694 (5029)	11 119 (6129)	8964 (4187)
Within-group sig.	$P = 0.06^\dagger$		NS
PTSD [mean (SD)]	9520 (4614)	11 272 (5145)	11 351 (6771)
Between-group sig.	NS	NS	NS

HC, healthy controls; PTSD, posttraumatic stress disorder; Sig, significance.

\*Significant within-group effect ( $P < 0.05$ ).

\*\*Significant within-group effect ( $P < 0.01$ ).

†Trending within-group effect.

Table 3. Partial correlations between theory of mind performance and clinical measures in the PTSD sample

	BDI	MDI
Interpersonal perception task		
Kinship	-0.074	-0.429*
Intimacy	-0.319	-0.020
Competition	0.084	0.038
Status	0.155	-0.150
Deception	0.219	0.106
Total	0.070 <sup>r</sup>	-0.246 <sup>r</sup>
Subjective deviation (total-subjective)	0.316 <sup>r</sup>	0.109 <sup>r</sup>
Reading the mind in the eyes task		
Accuracy		
Positive	-0.379	-0.435*
Neutral	-0.220 <sup>r</sup>	-0.481* <sup>r</sup>
Negative	-0.523** <sup>r</sup>	-0.328 <sup>r</sup>
Total	-0.443* <sup>r</sup>	-0.530** <sup>r</sup>
Response time		
Positive	-0.055	-0.049
Neutral	-0.136	0.012
Negative	-0.225	0.014
Total	-0.150	-0.158

Partial correlations controlling for years of education and verbal IQ.

Values are Spearman  $\rho$  partial correlation coefficients unless denoted by  $r$ , indicating a Pearson partial correlation coefficient.

BDI, Beck Depression Inventory; MDI, Multiscale Dissociation Inventory.

\* $P < 0.05$ .

\*\* $P < 0.01$ .

( $\rho = -0.43$ ,  $P = 0.026$ ). A correlation emerged between total accuracy on the RMET and severity of depressive symptoms on the BDI ( $r = -0.44$ ,  $P = 0.02$ ). Specifically, poorer accuracy in classifying negative mental states on the RMET was strongly associated with elevated depressive symptoms ( $r = -0.523$ ,  $P = 0.006$ ). There was also a trending association between poorer accuracy in interpreting positive mental states and increased depressive symptoms ( $\rho = -0.379$ ,  $P = 0.056$ ).

Several significant associations also emerged between total RMET accuracy and dissociative symptoms. Specifically, overall lower accuracy on

the RMET was associated with higher dissociation ( $r = -0.53$ ,  $P = 0.01$ ) and, examined at the subscale level, particularly with higher levels of disengagement ( $r = -0.66$ ,  $P < 0.001$ ), memory disturbance ( $r = -0.40$ ,  $P = 0.04$ ), and identity dissociation ( $r = -0.63$ ,  $P = 0.001$ ). Stratifying by emotional valence, lower accuracy in labeling eyes portraying positive mental states was also associated with higher levels of dissociation ( $r = -0.44$ ,  $P < 0.01$ ), again mainly driven by increased levels of disengagement ( $\rho = -0.62$ ,  $P = 0.001$ ), memory disturbance ( $\rho = -0.48$ ,  $P = 0.01$ ), and identity dissociation ( $\rho = -0.51$ ,  $P = 0.008$ ). The accuracy of labeling eyes portraying neutral mental states was also found to be poorer in individuals with higher levels of dissociation ( $r = -0.48$ ,  $P < 0.01$ ), again mediated primarily via increased disengagement ( $r = -0.52$ ,  $P = 0.006$ ) and identity dissociation ( $r = -0.58$ ,  $P = 0.002$ ). In comparison, the association between accuracy of labelling negative mental states, and RMET reaction times across all valences, were not significantly associated with MDI total scores.

### Relation between ToM tasks and parental bonding

We assessed both, the categorical dimensions of the PBI (i.e., affectionate constraint, affectionless control, neglectful parenting, or optimal parenting) (34), and its scales (care and overprotection) with respect to ToM performance. No significant interactions between ToM performance and parental bonding were found.

### Comorbidity analysis

Exploratory analysis revealed no effect of depression comorbidity status on ToM performance on the RMET or IPT-15. Covarying RMET performance for depression symptom severity as assessed by the BDI yielded similar results.

## Discussion

To our knowledge, this is the first study to investigate theory of mind performance in individuals with PTSD related to childhood trauma. Here, we found deficits in ToM performance in women with PTSD compared with healthy controls. Specifically, women with past childhood trauma had difficulties interpreting scenes depicting kinship interactions. Additionally, this group displayed slowed reactions in response to photographs depicting emotionally salient mental states.

The altered perception of familial interactions in women with complex childhood trauma is a

substantial finding. To accurately perceive social interactions on the IPT-15, one must integrate non-verbal cues while assuming the perspectives of others. As no other significant group differences emerged among the remaining IPT-15 subscales, this suggests that ToM deficits in women with PTSD related to childhood abuse may be specific to situations involving family relationships. Indeed, women that have experienced childhood sexual abuse frequently report difficulties in marital functioning (35) and problems with attachment in adult relationships (36). Additionally, women who have experienced childhood physical or sexual abuse tend to perceive their family environments as less cohesive (37). However, our results do not demonstrate an association between decreased ToM performance and lower levels of parental bonding directly.

Despite comparable accuracy in labeling complex mental states, we found that women who have experienced PTSD related to childhood abuse displayed longer response latencies compared with healthy controls. Further, slower response times were only present during the labeling of emotionally salient (both positive and negative) mental states of the RMET, and not in response to neutral mental states. On the surface, it seems reasonable to suggest then that women with PTSD may have slower processing speeds during trials that require the integration of emotional and cognitive information. However, in our study, healthy controls exhibited faster response times on the emotionally salient trials in comparison with neutral trials. This is consistent with past research showing that the presence of an emotional component within facial expressions generally shortens neural processing speeds (38). However, it has been established that emotional processing of facial stimuli is a top-down process, requiring the availability of attentional resources (39). Following this notion, it is possible that women with childhood abuse were overwhelmed or distracted by the emotions presented in the photographs, rather than having slowed reaction times due to slower emotional processing speeds. The emotion-based distraction within the RMET task may have depleted the attentional resources necessary for the higher cognitive processing during perspective-taking. Further studies investigating the role of attention in perspective-taking, especially during emotionally salient situations, are warranted.

Several clinical measures were associated with ToM performance in our sample. The presence of dissociative symptoms was strongly associated with hindered accuracy of complex mental state identification and altered perception of kinship interac-

tions. Interestingly, only the accuracies of positive and neutral mental states were adversely affected by the presence of dissociative symptoms (specifically disengagement, memory disturbance, and identity dissociation). It is possible that due to the emotional overmodulation and related distancing from the emotional experience frequently experienced as a result of dissociation, these individuals were unable to optimally engage in affective perspective-taking, thus having difficulties interpreting specific situations that contained emotional undertones. It is also worth noting the possibility of an alternative origin of ToM deficits found in our study sample. The consistent correlations between increased measures of trait dissociation, heightened depressive symptoms, and hindered ToM performance in the PTSD sample may alternatively suggest that it is not childhood maltreatment or related PTSD per se that is contributing to ToM deficits, but rather the related symptomatology such as dissociation, depression/dysphoria, and emotion dysregulation. Although no previous literature has explored the role of dissociation in ToM, some studies have alluded to the moderating effect of depressive symptoms on ToM performance in mood disorders (40, 41). Future studies exploring the mediating and moderating factors affecting ToM performance in trauma-exposed individuals should include longitudinal study designs and compare ToM performance profiles across groups of individuals with categorically distinct trauma etiologies.

Contrary to literature focused on dysphoria (42, 43) showing increased accuracy to negatively valenced emotions, we found that trauma-exposed women with heightened depressive symptoms were less likely to correctly identify complex mental states, especially during negatively valenced trials. Depressive symptoms in women with PTSD due to childhood trauma may have a unique emotional processing influence that does not parallel the commonly found mood congruent bias (42–44). Colinearity between dissociative and depressive symptoms was assessed but was not found to be significant, indicating that in this sample, the depressive symptoms affect the perception of emotionally salient mental states independent of dissociation.

Despite knowledge of alterations in memory (45) and information (46) processing in PTSD, key questions remain unaddressed concerning the nature of interpersonal functioning experienced in trauma survivors, including trauma survivors' ability to engage in social cognition. Indeed, past research has shown alterations in empathy and emotional processing of facial expressions and prosody in individuals with PTSD (15, 19, 47, 48).

However, findings on ToM performance in PTSD have been more scarce and conflicting (15, 22). Additionally, it must be noted that many studies contain patient samples with varying etiologies of the disorder, hindering proper comparison. As there are variations in the findings between these study groups, the pattern of social cognition processing may depend on the nature of the trauma (e.g., duration, developmental window of the trauma, physical/emotional/sexual, and attachment trauma). Due to the predominance of child abuse in our society and its cascading deleterious effects on psychosocial functioning in adulthood, we have focused our investigation exclusively on women who were exposed to complex developmental trauma.

In parallel to behavioural changes, neuroimaging studies of patients with PTSD have found functional and structural alterations in neural regions that overlap highly with regions known to be responsible for social cognition (1, 49–51). Investigations into the default mode network (DMN), a collection of interconnected neural regions that are related to introspection and self-referential processing, have further elucidated the nature of functional alterations present in PTSD. Bluhm et al. (52) found reduced coactivation within the DMN activation, particularly between anterior (medial prefrontal cortex) and posterior (posterior cingulate cortex) nodes of the network, within women with chronic PTSD due to early-life trauma. This finding resembled the activation patterns seen in healthy 7- to 9-year-old children (53), suggesting that the developmental trajectory of the DMN may be highly sensitive to early-life stress. Interestingly, many of the brain regions found in the DMN are also implicated in many socio-cognitive functions including autobiographical memory and ToM (54). Since early-life trauma has been shown to cause a deleterious effect on DMN activation and its function has been associated with ToM performance, our findings of altered ToM performance in women that have undergone complex developmental trauma fall in line with this pattern of research.

Our modest sample size and the cross-sectional design are limitations of this study. Furthermore, all self-reports measures were of retrospective nature. Due to consistent evidence of ToM deficits in major depressive disorder (MDD) (55–57) and high cross-comorbidity between MDD and PTSD (58), future studies should include additional depressed comparison groups with and without childhood abuse to elucidate similarities and differences between these two symptomatically overlapping disorders. Additionally, our study sample was

exclusive to females exposed to complex childhood trauma; our findings therefore cannot be generalized to both sexes, to individuals who experienced single-incident trauma, or to individuals exposed to trauma occurring outside of developmentally critical periods. Since our study investigated only trait dissociation measures, future research should explore whether state dissociation is another possible mechanism contributing to the observed differences in ToM. Finally, despite covariation of RMET results for the group differences in years of education and IQ, we were not able to control for these differences in our non-parametric analysis of IPT performance.

Here, we provide initial insight into the theory of mind deficits experienced by women with complex childhood trauma. Specifically, these deficits appear to extend to the interpretations of social interactions involving familial relationships. We also found a disrupted pattern of processing of emotionally salient complex mental states, with the presence of dissociation symptoms compounding this effect. Having knowledge of altered mentalizing in individuals exposed to trauma may facilitate the development and utilization of socio-cognitive training treatments, specifically focusing on restructuring of schemas related to kinship interactions and increasing top-down cognitive control over emotionally salient facial expressions. In turn, this may provide more avenues to social support by enhancing family cohesion and increasing emotion regulation during poignant social interactions.

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