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## A deeper look at the association between childhood maltreatment and reflective functioning

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### ABSTRACT

Childhood maltreatment is theorized as impeding the development of reflective functioning (RF; ability to perceive and interpret oneself and others in terms of mental states). However, previous research typically failed to support this association or yielded small sized and mixed associations. This study aims to provide a deeper look at the association between childhood maltreatment and RF by characterizing two non-mentalizing categories. One-hundred-and-sixteen pregnant women (mean age = 27.62, SD = 4.52) from the community (48.3% with a university degree, 96.5% in a relationship with the other parent) retrospectively reported on childhood abuse and neglect using the Childhood Trauma Questionnaire. They also participated in the Adult Attachment Interview subsequently coded using the Reflective Functioning Scale. Participants with poor to low RF were allocated to one of two groups (disavowal-distancing or distorted-inconsistent) using indicators provided in the RF Scale. No association was found between childhood maltreatment and overall RF when controlling for education level. A multinomial logistic regression revealed that childhood maltreatment was strongly predictive of a disrupted, over-analytical and inconsistent reflection about mental states but not of a tendency to discourse little about mental states. This tendency was rather only predicted by education level. Findings suggest that childhood maltreatment would lead to specific impairments in RF and that not considering *how* individuals fail to mentalize about attachment relationships may mask strong associations between RF and its determinants and correlates, including childhood maltreatment.


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## Introduction

Childhood maltreatment represents a widespread hidden epidemic (Stoltenborgh et al., 2015; Van der Kolk, 2014) affecting about one third of the population (Afifi et al., 2014; Garon-Bissonnette, Grisé Bolduc, et al., 2022) and strongly predicting maladaptation and psychopathology (Linden & LeMoult, 2022; Teicher et al., 2022). Yet, exposure to childhood maltreatment is not deterministic and many individuals successfully adapt in the face of trauma (Racine et al., 2022). Developmentalists argue that one of the keys to promoting adaptive functioning following childhood maltreatment lies in the understanding of dynamic psychosocial and developmental mechanisms by which resilience unfolds in the face of adversity (Berthelot, Lemieux, & Maziade, 2019; Overbeek, 2022; Racine et al., 2022; Shonkoff, 2016). Mentalization, a social-cognitive, interpersonal, and developmental process, may be particularly relevant for our understanding of risk and resilience trajectories following childhood maltreatment (Allen, 2007). Indeed, over the past 10 years, good mentalizing abilities have consistently been associated with better functioning in adults with histories of childhood maltreatment (Belvederi Murri et al., 2017; Berthelot, Lemieux, Garon-Bissonnette, et al., 2019; Chiesa & Fonagy, 2014; Huang et al., 2020; MacIntosh, 2013; Quek et al., 2017; Schwarzer et al., 2021; Weijers et al., 2018). However, it remains uncertain at this point *whether* and *how* childhood maltreatment would hinder the development of mentalization (Oehlman Forbes et al., 2021), and specific types of impairments in the mentalization of attachment relationships of survivors of childhood maltreatment still have to be investigated.

## Mentalization

Mentalization, operationalized as reflective functioning (RF), refers to the ability to perceive and interpret the self and others in terms of intentional mental states, such as feelings, thoughts, intentions, beliefs, or desires (Fonagy et al., 2002). Mentalizing is a complex and transactional “evolutionarily prewired” umbrella capacity (Luyten, Campbell, Allison, et al., 2020) integrating (or calibrating) automatic and controlled processes as well as cognitive and affective abilities that are oriented towards the self and others (Fonagy & Bateman, 2019). Effective mentalizing enables behaviors to become predictable (Fonagy et al., 1998), helps make sense of oneself and others, and is central to emotional regulation (Asen & Fonagy, 2017), therefore leading to adaptive functioning (Fonagy et al., 2002; MacIntosh, 2013).

From the first months of life, neurotypical infants show elementary capacity for joint attention and shared intentionality (Luyten, Campbell, Allison, et al., 2020), core abilities for mentalizing. Still, however, RF is fundamentally social and developmental and emerges from attachment relationships (Fonagy et al., 1991) and the broader social environment (Allen et al., 2008; Luyten, Campbell, Allison, et al., 2020). Sensitive caregivers who respond to their child’s emotional experience with contingent, congruent, and marked affective mirroring (Slade et al., 2005) enable their child to develop a coherent representation of their internal world (Fonagy et al., 2002). This experience of being held in mind by a caregiver is crucial in developing a sense of self and identity (Luyten, Campbell, & Fonagy, 2020) and emotional regulation capacities (Sharp & Fonagy, 2008). Moreover, interactions with other mentalizing family members, adults, and peers (Asen & Fonagy,

2017) as well as a caring, adequate, and stimulating broader sociocultural environment (Luyten, Campbell, Allison, et al., 2020) further cultivate children's understanding of the psychological world, contributing to the development of mentalization.

### ***Childhood maltreatment and the development of RF***

Childhood maltreatment intertwines with three core developmental processes underlying RF. First, maltreating parents typically fail to – either momentarily or permanently – recognize or consider their children's mental states and deprive them of an environment where they are safe to explore their inner world (Allen et al., 2008; Luyten & Fonagy, 2019), which would skew the normal development of RF (Steele & Steele, 2008). Second, an accumulating body of evidence suggests that childhood maltreatment impedes affect regulation (Warmingham et al., 2022) and disrupts the attachment system (Cyr et al., 2010). Maltreatment experiences and the collapse in attachment strategies that enable the use of the parent as a safe haven are likely to impede the recalibration of RF under stressful situations or when facing adversity (Luyten, Campbell, Allison, et al., 2020). Third, even when it happens outside the intrafamilial environment, childhood maltreatment represents a severe attack on physical and psychological integrity during a period of great immaturity and is therefore particularly difficult to integrate (Allen, 2007). Thus, children facing interpersonal trauma are more often than not left alone with unbearable and endangering mental states (Lorenzini et al., 2018).

For the reasons raised previously, childhood maltreatment may lead to poor RF and a predominance of prementalizing modes persisting into adulthood and manifesting in two ways. On the one hand, it is suggested that adults may have failed to develop proper reflective functioning or may defensively withdraw from thinking in terms of mental states (Allen et al., 2008) in an attempt to protect themselves from threatening, unacceptable, or dangerous feelings and emotions (Cicchetti & Toth, 2005; Lorenzini et al., 2018). Such a hypothesis that maltreatment or adversity would lead to “distancing” from reflection about mental states finds support in neurobiological studies reporting that the prefrontal cortex, underlying the most complex cognitive abilities, would be particularly sensitive to the effects of stress and adversity. Indeed, exposure to severe stressors during sensitive periods of brain development would lead to an important loss of prefrontal cognitive abilities (Arnsten, 2009), at the core of conscious and nuanced reflective processes (Luyten & Fonagy, 2015). Moreover, recent data showed less activity in brain regions involved in social cognition and perspective-taking (i.e. the right temporoparietal junction) in adult women sexually abused during childhood (Cracco et al., 2020). On the other hand, recent work suggests that facing stress or adversity would lead to a shift to rapid and automatic RF rather than controlled and nuanced mentalizing (Luyten & Fonagy, 2019; Luyten, Campbell, & Fonagy, 2020). This hypothesis of a “distorted” mode of thinking about mental states also finds support in neurobiological studies showing a switch from slow, controlled and nuanced processing of social information subserved by prefrontal executive functions to unconscious, automatic and biased reflection (flight-fight-freeze responses; posterior cortical and limbic structures) as stress and emotional arousal increase (Luyten & Fonagy, 2015).

Despite extensive theoretical work linking childhood maltreatment to poor RF, only a handful of studies lend partial support to the hypothesis that maltreatment impedes RF

and generally yielded small and mixed associations (Belvederi Murri et al., 2017; Brune et al., 2016; Chiesa & Fonagy, 2014; Huang et al., 2020; Mohaupt & Duckert, 2016; Quek et al., 2017; Schwarzer et al., 2021; Weijers et al., 2018). Classically, RF has been measured using the *Reflective Functioning scale* (RF scale; Fonagy et al., 1998) applied to two interviews, the *Adult Attachment Interview* (AAI; George et al., 1996) and the *Parent Development Interview* (PDI; Slade, Aber, et al., 2004). The RF scale yields scores ranging between  $-1$  and  $9$ , higher scores reflecting more complexity in reflection about mental states. To our knowledge, only six studies across five samples used this gold-standard assessment to examine the association between childhood maltreatment and RF. Whilst an important association between childhood maltreatment and RF was found in one sample, abuse and neglect being associated with a  $1.1$  point decrease on the  $11$ -point RF scale (Chiesa & Fonagy, 2014), one yielded mixed associations – finding only an association between physical abuse and parental RF, but no association with other types of maltreatment (Mohaupt & Duckert, 2016) – and no association was observed between childhood maltreatment and RF in three samples assessed using the AAI or the PDI (Huth-Bocks et al., 2014; Newman-Morris et al., 2020; Stacks et al., 2014; Taubner & Curth, 2013). Finally, research on patients with PTSD also yielded no association between post-traumatic symptoms and parental RF (Suardi et al., 2020).

Two hypotheses may be raised to explain this failure to empirically support and replicate the theorized adverse association between childhood maltreatment and RF. First, it may be that child maltreatment has a definitive impact on RF in the short term, but that many survivors benefit from professional support or experience benevolent relationships that contribute to restore mentalization (Ensink et al., 2014; Fonagy et al., 2023). Indeed, previous studies showed that up to  $40\%$  of mothers having experienced childhood maltreatment exhibited definitive to sophisticated RF, which buffered against the deleterious impact of child maltreatment on mental health and mother-child attachment insecurity (Fonagy et al., 1994; Steele & Steele, 2008). Second, it may be that survivors of abuse or neglect have a tendency to discourse much about mental states without being grounded in reality and whilst being overactive or self-absorbing (i.e. *hypermentalizing* or *pseudomentalizing*; Fonagy & Bateman, 2019; Luyten et al., 2019), which some suspect as leading to artificially high scores on the RF scales (Alismail et al., 2022; Fonagy, Slead, et al., 2016). The recent development of the *Reflective Functioning Questionnaire* (RFQ; Fonagy, Luyten, et al., 2016), which measures impairments in mentalizing rather than the complexity of RF and includes a scale measuring such overactive mentalization, could have helped to clarify this second hypothesis. However, only two studies supported the idea that childhood maltreatment would be associated with a particular impairment in RF characterized by a hypermentalizing stance and found small size associations (Berthelot, Lemieux, Garon-Bissonnette, et al., 2019; Huang et al., 2020), whereas two other studies did not observe such an association (Garon-Bissonnette, Duguay, et al., 2022; Schwarzer et al., 2021). These four studies rather found more consistent associations between childhood maltreatment and *hypomentalization*, reflective of the opposite tendency (i.e. a withdrawal from thinking in terms of mental states). However, to our knowledge, the only study evaluating the convergent validity of the RFQ against the gold standard RF scales reported no association between the two types of impairments assessed in the self-reported questionnaire and RF scores obtained by independent raters using the *Parent Development Interview*, suggesting that both

**Table 1.** Overall RF scores and mentalizing categories.

Scale	Low to limited RF stances	
	Disavowal-distancing category	Distorted-inconsistent category
-1	Interviewees respond with hostile refusal or marked evasiveness to questions demanding RF (at least 3) and typically lack participation throughout the interview process.  <i>In the RF manual, this refers to responses coded as -1(A) Rejection of RF</i>	Interviewees' attributions about mental states are confused, hard to understand and responses are bizarre, inappropriate, or unintegrated. Attributions are shocking rather than simply unusual or odd.  <i>In the RF manual, this refers to responses coded as -1(B) Unintegrated, Bizarre or Inappropriate</i>
1	Interview has instances showing ignorance concerning mental states (at least 3), and interviewees respond with passive evasion through generalized or sociological statements concerning mental states.  <i>In the RF manual, this refers to responses coded as 1(A) Disavowal</i>	Interview contains flawed reflection, typically egocentric, self-aggrandizing, or exaggerated (at least 3). Interviewees show marked inconsistencies in their understanding of the internal world.  <i>In the RF manual, this refers to responses coded as 1(B) Distorting/self-serving</i>
3	Interviewees show partial understanding of mental states that does not go into complexities and are often banal, clichéd, or superficial. If instances of RF, these are compromised with disavowal.  <i>In the RF manual, this refers to responses coded as 3(A) Naïve-simplistic and 3(C) Miscellaneous low RF</i>	Interview first seems reflective but is quite diffuse and unintegrated and interviewees are typically over-analytical (at least 3 instances).  <i>In the RF manual, this refers to responses coded as 3(B) Over-analytical or hyperactive RF</i>
5	<b>Definitive-sophisticated category</b>	Interview seems reflective, even achieving high levels of understanding in some parts, but RF is not maintained in problematic areas of the interview.  <i>In the RF manual, this refers to responses coded as 5(B) Inconsistent level of understanding</i>
7		
9		

Note. The three groups of RF are adapted from Common types of RF presented in pages 42–46 of the *Reflective functioning manual, version 5.0, for application to adult attachment interviews* (Fonagy et al., 1998).

measures may evaluate complementary dimensions of RF (Anis et al., 2020). Some pre-occupations about the construct validity of the hypermentalization scale of the RFQ were also raised, whereas endorsement of this scale was associated with adaptive functioning (Badoud et al., 2016). Notwithstanding, the original coding system of RF offers clear indicators to classify poor RF according to whether individuals respond in a distancing or an overactive and distorted fashion (see Table 1). The authors state that “[these] categories (. . .) are offered tentatively, in the hope that further research may help clarify the meaning of these individual differences in responding to the demand to reflect upon and evaluate the meaning of one’s attachment history” (Fonagy et al., 1998, p. 28). This calls for further studies using the well validated original coding system of RF and a deeper analysis of participants’ narrative, especially those who may be pseudomentalizing, to understand inconsistencies observed in RF research (Alismail et al., 2022) and appreciate the complex association between childhood maltreatment and RF in adulthood.

### The current study

The present study aims to provide a deeper look at the association between childhood maltreatment and RF. Given that pregnancy represents a period of intense transitions (Slade et al., 2009) calling for reflection while simultaneously reactivating attachment representations (Granner & Seng, 2021), it constitutes a particularly relevant period to examine the association between childhood maltreatment and

attachment-based RF using the AAI. We thus conducted the study with a socioeconomically diverse population-based sample of pregnant women. We also considered previously documented risk factors for impaired mentalizing such as lifetime psychiatric disorders (Luyten, Campbell, Allison, et al., 2020) and sociodemographic risk factors (age, education level, marital status and annual income; Chiesa & Fonagy, 2014; Newman-Morris et al., 2020; Slead et al., 2020; Stacks et al., 2014). In comparison to previous studies, instead of relying solely on the global score of RF on the AAI, we went a step further and qualified non-mentalizing stances according to whether participants' responses during the interview reflected *disavowal-distancing* processes or *distorted-inconsistent* mentalization (Table 1). Considering Luyten's et al. (2019) recent model suggesting that stress and adversity lead to disrupted and automatic RF, we hypothesized that childhood maltreatment would be moderately associated with the total score of RF at the AAI, but would be strongly associated with distorted-inconsistent mentalization.

## Method

### *Participants and procedure*

Participants were recruited in the course of a larger longitudinal study on childhood maltreatment and parenthood. Inclusion criteria were being pregnant, aged 18 years or older, French speaking, and not suffering from a psychotic disorder. Two recruitment strategies were used. First, 223 pregnant individuals were invited to participate in the study during prenatal classes between September 2015 and September 2018. They completed a contact information sheet and the Childhood Trauma Questionnaire on site and later completed the initial self-reported assessment at home on a secure web platform. Participants who met the inclusion criteria and who lived less than 60 km from our lab were next contacted by a research assistant to participate in an interview and complete a questionnaire at home or in our lab ( $n = 101$ ,  $M = 34.70$  weeks pregnant,  $SD = 2.34$ ). Overall, out of the 223 participants initially enrolled in the study, 101 were included in the present sample: 95 were not invited for the interview because they lived more than 60 km from our lab, 22 refused to participate or could not be reached, and five met the exclusion criteria for the larger study (e.g. suffering from psychosis or having already given birth at the time of the interview). Women who participated in the interview and those who did not were similarly exposed to childhood maltreatment,  $\chi^2(2) = 5.06$ ,  $p = .09$ . Then, to increase the representation of participants in the sample having experienced childhood maltreatment, 15 pregnant individuals who were recruited between August 2019 and August 2021 to participate in a prenatal group intervention for women having been exposed to childhood maltreatment (the STEP Program; Berthelot et al., 2021) were included in the analyses. These participants were informed of the study at their first pregnancy monitoring appointment and were contacted by a research assistant during the second trimester of pregnancy. They completed the AAI and questionnaires at the baseline assessment ( $M = 22.2$  weeks pregnant,  $SD = 4.18$ ) prior to the intervention. These participants were not necessarily experiencing psychological distress or psychosocial difficulties and can be considered belonging to a community sample of pregnant individuals having



experienced childhood maltreatment. The final sample was thus comprised of one hundred and sixteen pregnant individuals, all identifying as women. The study received ethical approvals from our University Ethics Committee (Comité d'éthique de la recherche avec des êtres humains de l'Université du Québec à Trois-Rivières [CER-15-210-07; CER-16-226-10]) and the Institutional Review Board of our regional Health Centre (Comité d'éthique de la recherche du Centre intégré universitaire de santé et de services sociaux de la Mauricie-et-du-Centre-du-Québec [CER-2014-027; CER-2016-016-11]).

## Measures

**History of childhood maltreatment** was assessed using the 28-item Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). The CTQ-28 assesses the severity of exposure to childhood maltreatment (total score) as well as five types of abuse and neglect with validated cut-offs for each subscale: physical ( $\geq 8$ ), sexual ( $\geq 8$ ) and psychological ( $\geq 10$ ) abuse, physical ( $\geq 8$ ) and psychological ( $\geq 15$ ) neglect (Walker et al., 1999). Responses are rated on a 5-point Likert scale from 1 (*never true*) to 5 (*always true*) with higher scores indicating more severe exposure to childhood abuse or neglect. In the current study, participants with at least one subscale above the cut-off were classified as having been exposed to childhood maltreatment, whereas cumulative childhood maltreatment was defined as having been exposed to at least two different types of traumas. The CTQ-28 is validated across clinical and general populations (Bernstein et al., 2003; Walker et al., 1999). In this study, the internal consistency was good (Cronbach's  $\alpha = 0.82$  for the total score and between 0.76 and 0.92 for the subscales).

**Reflective functioning** was assessed through the coding of Adult Attachment Interview (AAI; George et al., 1996) transcripts using the Reflective Functioning Scale (Fonagy et al., 1998), the gold standard measure of RF. The AAI is a semi-structured interview with 20 open-ended questions on adults' relationship with their primary caregivers through childhood and adolescence, on experiences of separation, rejection, abuse, losses and other potentially traumatizing events, and on the impact of these experiences on their adult personality (George et al., 1996). The RF Scale is an 11-point scale ranging from  $-1$  (negative RF, attack on mentalization) to 9 (exceptional, complex reasoning on mental states). Scores from 1 to 3 reflect either concrete or excessively detailed and distorted mentalizing, and scores of 5 usually indicate a basic understanding of how mental states influence behavior. Coding is based on 21 indicators grouped according to four core dimensions of RF: 1) *Awareness of the nature of mental states* (e.g. recognition of the limitations of insight); 2) *The explicit effort to tease out mental states underlying behavior* (e.g. accurate attributions of mental states to others or self); 3) *Recognizing developmental aspects of mental states* (e.g. revising thoughts and feelings about childhood in light of adult understanding), and 4) *Mental states in relation to the interviewer* (e.g. acknowledging the separateness of minds). All eight questions of the AAI explicitly calling for RF (demand questions e.g. *In general, how do you think your overall experiences with your parents have affected your adult personality?*) are scored on the  $-1$  to 9 scale, whereas the remaining questions (permit questions) are coded only when participants show clear mentalizing efforts (score  $\geq 4$ ) or when they actively refuse or attack mentalizing (score  $< 1$ ). Hence, non-reflective responses to permit questions (e.g. *I'd like you to try to describe*



your relationship with your parents as a young child if you could start from as far back as you can remember?) carry less weight than non-reflective responses to demand questions on the overall score. The overall RF score is based on the rater's judgement of the interview, the participant's usual levels of RF and the diversity of indicators. The coding manual also provides clear indicators to distinguish whether participants with poor/limited RF generally responded in a *disavowal-distancing* way (i.e. rejection, disavowal, or naïve/concrete RF) or in a *distorted-inconsistent* fashion (i.e. distorted, over-analytical, self-serving, or inconsistent RF) during the whole interview. These indicators were used to allocate participants to one of three RF groups: (1) Poor/limited RF - *Disavowal-distancing*, (2) Poor/limited RF - *Distorted-inconsistent*, and (3) *Definitive-sophisticated* RF. More details on this codification are provided in [Table 1](#).

The two categories of poor/limited RF can be considered as reflecting regressions to prementalizing modes of psychic functioning (Duschinsky & Foster, 2021; Terradas et al., 2020). While each prementalizing mode may fall under either of the two categories of poor/limited RF, instances of teleological modes are particularly likely to be coded under the *disavowal-distancing* stance given that they frequently manifest through a tendency to rely on observable aspects. Contrarily, instances of psychic equivalence (i.e. when there is no distinction between internal and external reality) are likely to be triggered by high levels of emotional arousal and to lead to psychological discourses lacking coherence, which is typically captured by the *distorted-inconsistent* stance. Instances of pretend mode, which can be observed when mental states are kept separated from external or internal reality, can equally fall under the *disavowal-distancing* stance (e.g. when the participant intellectualizes to avoid painful affects) or the *distorted-inconsistent* stance (e.g. when the person uses psychological jargon but the discourse is characterized by a lack of integration between cognition and affects).

In the present study, the AAI was audiotaped and transcribed, and then independently coded by an accredited rater who had shown to be reliable according to the Anna Freud Centre standards, blind to all other measures.

**Potential confounding variables** were assessed using a self-reported demographic questionnaire. This questionnaire included questions on age, parity, income, marital status, and education level as well as one question on lifetime (current or past) psychiatric diagnoses (i.e. *Have you suffered or do you currently suffer from a mental health disorder?*) as reported by the participants.

### **Data analysis strategy**

Data analyses were performed using IBM SPSS, version 26.0. Data screening detected no univariate outliers (standardized scores over 3.29) and both skewness and kurtosis for all variables were within the normal range. Two approaches were used to assess *whether* and *how* childhood maltreatment predicts RF. In a first approach, analyses were conducted using the RF total score. First, Pearson bivariate correlations and *t*-tests were used to examine the association between RF, childhood maltreatment (using both the total score at the CTQ and the subtypes scores), lifetime psychiatric disorders, and potentially confounding variables (age, annual income, ethnicity, and marital status). Second, analysis of covariance (ANCOVA) controlling for confounding variables were computed to assess whether the RF

total score varied as a function of having been exposed to childhood maltreatment or not. We reported adjusted marginal means of RF (considering covariates) for each group. Third, to evaluate the association between cumulative childhood maltreatment and RF, we also compared women having been exposed to cumulative childhood maltreatment (i.e. reaching the cut-off on at least two different types of abuse or neglect) to women having been exposed to one or no experience of abuse or neglect using an ANCOVA controlling for confounding variables.

In a second approach, we classified participants with poor/limited RF according to whether their narrative was qualified as *disavowal-distancing* or *distorted-inconsistent*, whilst those displaying a definitive ability to reflect in terms of mental states were classified as *definitive-sophisticated* (see Table 1). To evaluate whether participants with distorted-inconsistent responses obtained similar RF scores than women having a disavowal-distancing approach during the AAI, we first performed an analysis of variance (ANOVA) comparing mean RF scores of participants classified in these three categories and conducted a posteriori comparisons using the Games-Howell procedure. The RF categories were then compared according to childhood abuse or neglect, first using Chi-square tests of independence to evaluate the frequencies of each category according to the women's exposition to childhood maltreatment. Next, we used multinomial logistic regression to evaluate the predictive role of childhood maltreatment and confounding variables on the two non-reflective categories, using participants classified under the definitive-sophisticated category as a reference group (i.e. multicategorical dependent variable). The contribution of each variable was evaluated while controlling for all predictors simultaneously. In a complementary approach, we performed Chi-square tests of independence and calculated the odds ratios of falling under each category of non-reflective narratives for women exposed to cumulative and single childhood maltreatment experiences in comparison to women reporting no instances of abuse or neglect.

## Results

### *Sample characteristics*

Characteristics of participants are presented in Table 2. Overall, the present sample is rather socioeconomically diverse, family income ranging from less than C\$14 999 to more than C\$95 000 a year with 28.4% of participants being below the low-income cut-off for a family with one child. Nearly half of the sample reported having a university degree (48.8%). However, pregnant individuals identifying as white (89.7%) women (100%) were overrepresented in the sample. More than half of participants reported a history of mental health disorders (54.3%) and a similar proportion reported having been exposed to childhood maltreatment (45.7%), the most frequent types being emotional abuse (30.2%) and physical neglect (24.1%). Of those participants having been exposed to childhood maltreatment, 54.7% ( $n = 29$ ) experienced cumulative childhood maltreatment (i.e. two or more forms of abuse or neglect).

**Table 2.** Participants' sociodemographic, maltreatment, and psychiatric characteristics.

	<i>M (SD)</i>
<b>Age</b>	27.62 (4.52)
<b>Gestational weeks</b>	33.07 (4.98)
<b>RF in (non)-mentalizing groups</b>	
Disavowal-distancing	2.69 (1.06)
Distorted-inconsistent	3.18 (1.51)
Definitive-sophisticated	5.79 (0.72)
	<i>n (%)</i>
<b>Primiparous</b>	111 (95.7)
<b>Marital status</b>	
In relationship	112 (96.5)
Single	4 (3.5)
<b>Education level</b>	
High school diploma or less	17 (14.6)
Collegial or professional training	43 (37.1)
University degree	56 (48.3)
<b>Ethnicity<sup>a</sup></b>	
White	104 (89.7)
Minority	8 (6.9)
<b>Annual income below low income cut-off<sup>b</sup></b>	33 (28.4)
<b>Childhood maltreatment</b>	53 (45.7)
Physical abuse	14 (12.1)
Sexual abuse	24 (20.7)
Emotional abuse	35 (30.2)
Physical neglect	28 (24.1)
Emotional neglect	20 (17.2)
Cumulative trauma	29 (25.0)
<b>Lifetime (past or current) psychiatric disorders</b>	63 (54.3)

Note. The sample includes 116 pregnant individuals, all identifying as women.

<sup>a</sup>Missing data for  $n = 4$ ; <sup>b</sup>The low-income cut-off for a family with one child in Canada is \$C33 396.

### Childhood maltreatment and complexity of reflective functioning

Severity of childhood maltreatment was associated with lower levels of RF (Table 3). With regard to potential covariates, only education level was associated with RF and was therefore included as a covariate in the subsequent analyses. RF also did not vary as a function of history of lifetime psychiatric disorders,  $t(112) = -1.10$ ,  $p = .27$ . ANCOVA controlling for education revealed no significant group differences between women having been exposed to maltreatment ( $M_{adjusted} = 4.37$ ,  $SE = 0.23$ ) and those reporting no maltreatment ( $M_{adjusted} = 4.26$ ,  $SE = 0.21$ ) on total RF score,  $F(1, 113) = 0.13$ ,  $p = .72$ , and between women having been exposed to cumulative ( $M_{adjusted} = 4.27$ ,  $ES = 0.31$ ), single ( $M_{adjusted} = 4.70$ ,  $ES = 0.32$ ) and no ( $M_{adjusted} = 4.27$ ,  $ES = 0.21$ ) maltreatment,  $F(2, 112) = 1.00$ ,  $p = .37$ .

### A deeper look at mentalizing in women having experienced childhood maltreatment

A significant ANOVA ( $F [2, 113] = 131.46$ ,  $p < .001$ ) showed that women in the *disavowal-distancing* ( $M = 2.69$ ,  $SD = 1.06$ ) and the *distorted-inconsistent* ( $M = 3.18$ ,  $SD = 1.51$ ) categories were similar in terms of total score of RF ( $p = .45$ ), both having significantly lower

**Table 3.** Pearson bivariate correlations between severity of child maltreatment, reflective functions and potentially confounding variables.

Variable	1	2	3	4	5	6	7	8	9	10
1. RF total score										
2. Child maltreatment <sup>a</sup>	-0.22*									
3. Physical abuse	-0.18	0.71***								
4. Sexual abuse	-0.16	0.53***	0.35***							
5. Emotional abuse	-0.18	0.88***	0.59***	0.26**						
6. Emotional neglect	-0.11	0.84***	0.44***	0.18	0.73***					
7. Physical neglect	-0.22*	0.84***	0.52***	0.22*	0.74***	0.76***				
8. Age	0.06	-0.18	-0.09	-0.12	-0.09	-0.17	-0.24**			
9. Education level	0.45***	-0.30**	-0.09	-0.25**	-0.24**	-0.25**	-0.31**	0.32***		
10. Annual income	0.14	0.08	-0.03	0.10	0.14	0.11	-0.05	0.15	0.23**	
11. Marital status	-0.09	0.06	0.02	0.14	0.08	-0.04	0.04	-0.03	0.04	-0.13

Note. <sup>a</sup> CTQ total score.

<sup>†</sup> $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

scores than women reporting definitive or sophisticated RF ( $M = 5.79$ ,  $SD = 0.72$ ;  $p_s < .001$ ). Multinomial logistic regression analysis revealed that both education level,  $\chi^2(2) = 22.03$ ,  $p < .001$ , and childhood maltreatment,  $\chi^2(2) = 8.49$ ,  $p = .01$ , predicted classification in the three categories. The model demonstrated a good fit and explained 29.4% of the variance in mentalizing (Table 4). The first comparison showed that only education level differentiated women in the *disavowal-distancing* and *definitive-sophisticated* categories, whereas higher education level was associated with a reduced risk of distancing oneself from thinking about mental states. Then, the second comparison revealed that education level and childhood maltreatment both predicted classification in the *distorted-inconsistent* in contrast to the *definitive-sophisticated* category, with women having been exposed to childhood maltreatment being at a 5.97-fold increased risk of distorted or inconsistent RF in comparison to non-exposed women. Finally, the last comparison showed that only childhood maltreatment differentiated women displaying distorted or inconsistent narratives from those distancing themselves from reflection in terms of mental states. Women had a 5.78-fold increased risk of being classified as *distorted-inconsistent* rather

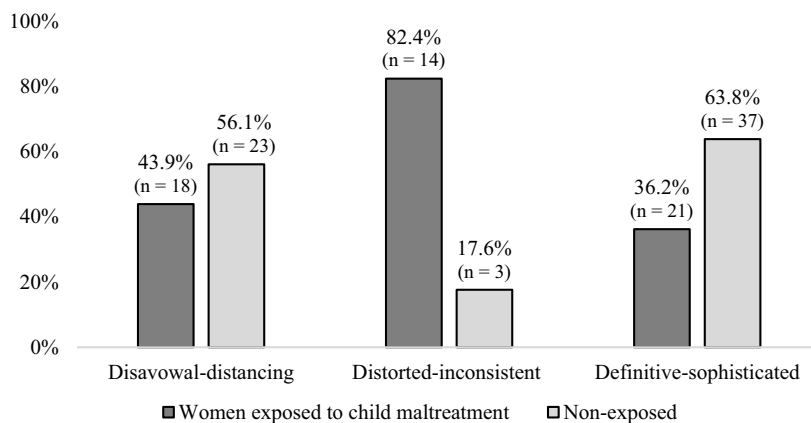
**Table 4.** Multinomial logistic regression examining the predictive role of childhood maltreatment and education level on the three RF groups.

Predictor	Disavowal-distancing vs Definitive-sophisticated				Distorted-inconsistent vs Definitive-sophisticated				Distorted-inconsistent vs Disavowal distancing			
	b (SE)	Odds Ratio <sup>a</sup>	95% CI		b (SE)	Odds Ratio <sup>a</sup>	95% CI		b (SE)	Odds Ratio <sup>a</sup>	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Education <sup>b</sup>	-0.67 (0.18)	<b>0.51</b>	<b>0.36</b>	<b>0.73</b>	-0.75 (0.23)	<b>0.47</b>	<b>0.30</b>	<b>0.75</b>	-0.08 (0.21)	0.92	0.61	1.39
Childhood maltreatment	0.03 (0.46)	1.03	0.42	2.53	1.79 (0.72)	<b>5.97</b>	<b>1.46</b>	<b>24.48</b>	1.76 (0.71)	<b>5.78</b>	<b>1.43</b>	<b>23.43</b>

Note.  $R^2 = 0.254$  (Cox-Snell), 0.294 (Nagelkerke). Model fit  $\chi^2(4) = 33.97$ ,  $p < .001$ .

<sup>a</sup>In multinomial logistic regression, the odds ratio is used to estimate to odds of membership in a particular classification (i.e., *disavowal-distancing* or *distorted-inconsistent*) compared to a reference group (i.e. *definitive-sophisticated*); <sup>b</sup>A low score is indicative of lower education.

than *disavowal-distancing* when they reported experiencing maltreatment as a child. **Figure 1** displays the proportions of childhood maltreatment exposed and non-exposed women in the *disavowal-distancing*, *distorted-inconsistent*, and *definitive-sophisticated* groups. Finally, complementary results on cumulative childhood maltreatment yielded similar results: women having been exposed to single or cumulative childhood maltreatment were respectively 4.00 and 10.53 times more likely to display *distorted-inconsistent* RF than non-exposed women (**Figure 2**).

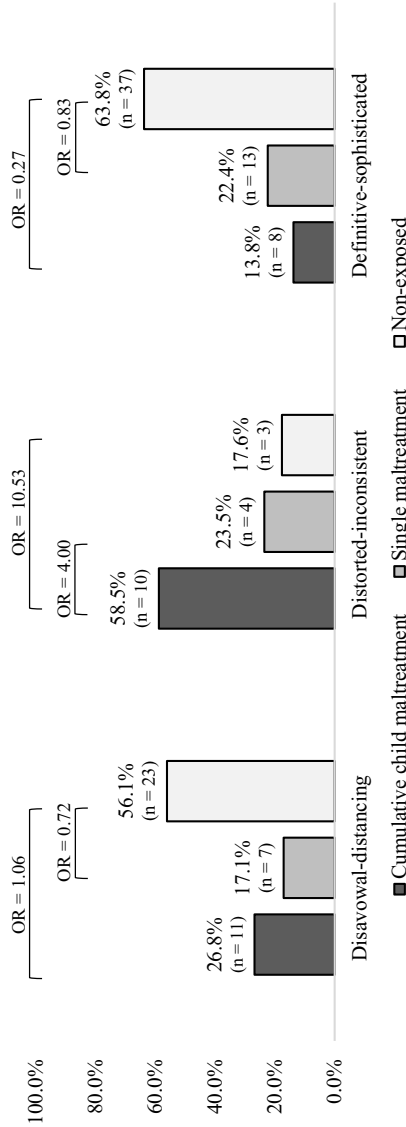


**Figure 1.** Comparison of non-mentalizing category in child maltreatment exposed and non-exposed women. *Note.* Distributions were homogeneous within the *disavowal-distancing* category,  $\chi^2(2) = 0.08$ ,  $p = .78$ , and heterogeneous within the *distorted-inconsistent*,  $\chi^2(2) = 10.79$ ,  $p = .001$ , and *definitive-sophisticated*,  $\chi^2(2) = 4.20$ ,  $p = .04$ , categories.

## Discussion

The present study examined the association between childhood maltreatment and RF in a population-based sample of pregnant women and further examined how childhood maltreatment impeded RF by operationalizing two non-mentalizing categories: the *disavowal-distancing* and *distorted-inconsistent* categories. Overall, we observed that childhood maltreatment was associated with lower levels of RF that failed to be sustained when controlling for education level, but was strongly associated with disrupted, over-analytical, or inconsistent reflection about mental states. Results thus lend support to Luyten and Fonagy's (2019) recent model in which adversity and stress would lead to disrupted, biased RF, rather than a withdrawal from RF or a particularly naïve mode of thinking about mental states.

Our findings have implications for the understanding of the impact of maltreatment on mentalization. First, they challenge the repeatedly reported claim that individuals having been exposed to childhood maltreatment would avoid thinking in terms of mental states to protect themselves from being in touch with unbearable mental states (Berthelot, Lemieux, Garon-Bissonnette, et al., 2019; Fonagy et al., 2002; Huang et al., 2020). Indeed, in our sample, women reporting no history of abuse or neglect (56.1%) were as likely as women having been exposed to childhood maltreatment (43.9%) to talk about attachment relationships during the AAI in a way that was either a rejection or disavowal of



**Figure 2.** Comparison of non-mentalizing category in women having been exposed to no, one or cumulative childhood maltreatment. *Note.* Distributions were homogeneous within the *disavowal-distancing* category,  $\chi^2(2) = 0.52, p = .77$ , and heterogeneous within the *distorted-inconsistent*,  $\chi^2(2) = 14.12, p < .001$ , and *definitive-sophisticated*,  $\chi^2(2) = 7.92, p = .02$ , categories; odds ratios (OR) were computed using non-exposed women as a reference group. An OR below 1 means that this mentalizing category is less likely to occur in the child maltreatment group.

mental states or was particularly naïve and concrete. In fact, such a tendency to discourse little about mental states had much to do with education in our sample. These results are consistent with previous observations of moderate size associations between RF scores, education level and vocabulary skills (Fonagy et al., 1998), as well as between lower RF and school difficulties (Poznyak et al., 2019). Steele and Steele (2008) hypothesized that the link between RF and education may go two ways: RF may empower individuals to pursue their academic studies just as much as intellectual capacities may predispose to better RF. It is also argued that a positive school environment may shape the development of perspective-taking by modeling positive communication and fostering openness to self and others (Hall et al., 2021). This supports the implementation of mentalization-based interventions in schools across childhood and adolescence (e.g. the *Creating a Peaceful School Learning Environment*; Twemlow et al., 2018).

Our results however revealed that childhood maltreatment is strongly predictive of attempts to reflect in mental state terms that end up being biased, over-analytical, inconsistent and unproductive, with pregnant women having been exposed to childhood maltreatment being 5.97 times more at risk than women without maltreatment, after controlling for education, of displaying distorted-inconsistent RF rather than definitive RF. This result suggests that childhood maltreatment may have a paradoxical effect on the development of mentalization rather than leading to a global deficit in RF. In line with Fonagy's, Sled, et al. (2016) discussion paper, we argue that childhood maltreatment may exert two opposing forces on RF. On the one hand, trying to overcome adversity may call for mentalizing efforts, maybe even more so than typical development. Indeed, healing from childhood maltreatment requires experiencing, recognizing, and containing emotions and involves a search for meaning and understanding in survivors (Stige et al., 2013). On the other hand, childhood maltreatment would deprive youths of many of the developmental precursors of mentalization, such as experiencing sensitive and reflective caregiving, and of the attachment strategies needed to handle intense and intrusive mental states (Luyten, Campbell, Allison, et al., 2020). These two contradictory forces may thus result in distorted and inconsistent mentalizing efforts, which were disproportionately more frequently observed in our sample in women who experienced cumulative childhood maltreatment in contrast to non-exposed women. Similar paradoxical effects of childhood maltreatment have been reported in attachment research. For instance, it has been proposed that maltreatment generally does not necessarily lead to a deactivation of the attachment system in young children but rather disorganizes it, which can be observed through children seeking to approach the attachment figure in times of distress, but in a way that is either interrupted, incomplete, or chaotic (Main & Solomon, 1990). Of note, our study focused on a sample of pregnant adult women; our findings and resulting model may not apply to younger children and adolescents who are still facing abuse or neglect and to non-expecting adults not currently going through such an intense period of transition during which reactivations of attachment representations are generally more salient. It is namely possible that attempts to mentalize reemerge only when people are no longer exposed to maltreatment and are relatively safe, that is, when they are no longer dependent on a caregiver who is at times a source of threat or harm. Indeed, facing such frights without solution may lead to a deactivation of the mentalizing system in order to maintain the attachment relationship and assure survival. When children get older and are no longer facing abuse or neglect they may become compelled to elaborate



an account of their traumatic life experiences (Ensink et al., 2014). Similarly, this tendency to use mental state terms – albeit biased or inconsistent – may arise when individuals succeed in resolving their traumatic experiences (i.e. attachment reorganization; Iyengar et al., 2019) or when they eventually develop secure representations of attachment during adulthood despite having been through difficult childhood experiences that typically lead to insecurity (i.e. “earned” security; Hesse, 2016; Main & Goldwyn, 1989). It will therefore be a priority for future research to evaluate the interplay between childhood maltreatment, attachment states of mind and non-mentalizing categories in adult populations.

In our sample, women without maltreatment were more likely to be classified as having definitive RF than women who experienced childhood maltreatment. Interestingly, however, two out of five women (36.2%) having been exposed to childhood maltreatment had definitive RF, a ratio that is almost identical to the one observed in Fonagy et al. (1994) initial study on RF in mothers exposed to childhood maltreatment (38.5%). Further, the severity of maltreatment was not associated with the total RF score when controlling for education. These results are in line with other evidence suggesting no or small associations between childhood maltreatment and RF measured through interviews (Huth-Bocks et al., 2014; Mohaupt & Duckert, 2016; Newman-Morris et al., 2020; Taubner & Curth, 2013) and self-reported questionnaires (Berthelot, Lemieux, Garon-Bissonnette, et al., 2019; Cristobal et al., 2017; Garon-Bissonnette, Duguay, et al., 2022; Schwarzer et al., 2021). However, they contrast with results from Chiesa and Fonagy (2014) showing that childhood abuse and neglect significantly predicted lower levels of RF in adult patients with personality disorders and controls. It is possible that a good proportion of child maltreatment-exposed adults in the general population may have benefited from individual or interpersonal protective factors throughout their development (i.e. *Post-traumatic growth*; Tedeschi et al., 2018) or developed evolutionarily adaptive strategies facing stressful conditions (i.e. *Conditional Adaptation to Stress*; Ellis & Del Giudice, 2019; Ellis et al., 2022). In turn, these protective factors, within or outside the family, may have helped them, as a child or an adult, to gain an understanding of mental states as a way of surviving their difficult experiences (Ensink et al., 2014; Fonagy et al., 2023). These hypotheses find support in recent studies on social-cognitive mechanisms showing enhanced affective empathy in adult survivors of childhood maltreatment from non-clinical samples (Greenberg et al., 2018), a positive association between childhood maltreatment and metacognition in young adults with a first-episode psychosis (Trauelsen et al., 2019), and small and non-robust meta-analytic associations between early adversity and prosociality (Wu et al., 2020). Therefore, our results and those of others suggest that a third profile of individuals may emerge following maltreatment and have different determinants and correlates: resilient individuals. Hence, further research should evaluate the interaction between childhood maltreatment and risk or protective factors across development to expand knowledge about *how* RF develops in conditions of interpersonal trauma or adversity and *which* dimensions matter in its development.

Finally, results that overall RF scores were similar in women classified under the disavowal-distancing and distorted-inconsistent categories further suggest that conducting research and statistical analyses using only continuous scores and not looking at how individuals attempt – or not – to mentalize in a more qualitative fashion may cover up important correlates of RF and interfere with our understanding of the developmental determinants of RF. They also raise concerns regarding the heterogeneity of individuals

falling under the poor to limited RF scores which may remain unnoticed with the sole use of continuous scores of RF. It is somewhat surprising that the RF scale (Fonagy et al., 1998) has provided clear indicators of different profiles of low RF for the past 25 years but that, to our knowledge, such profiles were never investigated in research. Evaluating the two categories of low to limited RF might lead to the detection of effects that were lost because of the heterogeneity of people with low RF. Of note, the current study provides support to the association between childhood maltreatment and specific impairments in RF during an interview that stimulates discourse about attachment relationships with caregivers (i.e. the AAI). Future research should replicate our findings and analyze separately the different non-mentalizing categories we observed in the course of the AAI in other samples and mentalizing contexts such as parental RF (Slade, Bernbach, et al., 2004) from the PDI (Slade, Aber, et al., 2004) and trauma-specific RF (Berthelot et al., 2015) from the Trauma Meaning-Making Interview (Simon et al., 2008).

### *Strengths and limitations*

This study has several strengths such as the use of a gold-standard interview-based assessment of RF and the novel classification of two non-mentalizing categories that may provide new orientations for empirical research on RF and clinical practice. However, the study's conclusions should be interpreted in light of some limitations. First, we relied on theoretical and historical grounds to interpret our findings as our study was cross-sectional and correlational in nature. The suggested direction between variables thus cannot be assured and precludes causal conclusions. Second, childhood maltreatment was assessed using a self-reported retrospective measure that may be sensitive to biases or distortions in recall, although it is well-validated and one of the most widely used self-reports of childhood maltreatment. Third, our sample comprises only pregnant women, reducing the generalizability of our findings. Our findings may not apply to samples of fathers, youths who are still facing maltreatment, and non-expecting adults. Fourth, our study neither included a longitudinal follow-up, nor observational measures of mother-infant attachment, maternal sensitivity nor maternal behaviors. Finally, our sample size was large, but not enough to properly study associations between different types of abuse or neglect and categories of RF. Future research should thus consider studying predictors and correlates of non-mentalizing categories in larger population-based and clinical samples, including samples of mother-infant dyads.

### *Implications and future directions*

Overall, the current study deepens our understanding of how childhood maltreatment may impede reflective functioning and supports newer theoretical models suggesting that adversity leads to disrupted, biased attempts of reflections in some survivors (Luyten & Fonagy, 2015, 2019; Luyten, Campbell, & Fonagy, 2020). Conversely, findings also suggest that many individuals develop good mentalizing abilities even in the context of childhood maltreatment which might reflect the interplay between childhood maltreatment and protective factors across development and support the implementation of mentalization-based interventions for adults and parents having experienced childhood maltreatment.

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No potential conflict of interest was reported by the authors.

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## Data availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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