



Intergenerational pathways from maternal childhood maltreatment to offspring adjustment: Mediating roles of attachment, sensitivity, and maternal psychopathology

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ABSTRACT

Background: Maternal childhood maltreatment might have long-lasting consequences, not only at the individual level but also within the family system. Yet few studies have used longitudinal observational measures of mother-child interaction to explain the consequences.

Objective: This study examined the longitudinal links between maternal childhood maltreatment and offspring's emotional and behavioral problems in late childhood, and explored maternal psychopathology, infant attachment, and maternal sensitivity as potential mediators.

Participants and setting: Using data from a large study in the Netherlands, we included 832 mothers followed from pregnancy until their children were 10 years old.

Methods: Mothers reported on their childhood maltreatment experiences (Childhood Trauma Questionnaire), and mental health problems during pregnancy and at child age 10 years (Brief Symptom Inventory). Observational measures for attachment (Strange Situation Procedure) at 1 year and maternal sensitivity at 1, 3, 4, and 10 years (Ainsworth and Erickson scales). Maternal reports of child internalizing and externalizing problems at 10 years (Child Behavior Checklist) were obtained. Structural equation modeling was used to test the direct and indirect effects.

Results: A direct association between mothers' experiences of maltreatment and greater behavioral and emotional problems in offspring, and an indirect association via maternal psychopathology during pregnancy and at 10 years was found. Findings did not support mediation by infant attachment or maternal sensitivity.

Conclusions: Mothers with a history of maltreatment experienced more mental health problems over the years. Underscoring the need for mental health support may help alleviate the lifelong consequences of maltreatment experiences, ultimately reducing the intergenerational transmission of psychopathology.

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1. Introduction

Child maltreatment has been identified as the most significant risk factor for current and later psychopathology (Cicchetti & Valentino, 2015). People who have experienced any form of maltreatment show elevated risks of depression, anxiety, and trauma (Hovens et al., 2015; LeMoult et al., 2020; Mandelli et al., 2015). Importantly, a mother's experience of childhood maltreatment (MCM) can have consequences for her child's well-being later on as well: studies reported that MCM is associated with adverse outcomes for both mother and child (Souch et al., 2022), such as hostile parenting (Savage et al., 2019), and an increased risk for psychopathology in offspring (Airikka et al., 2023; Plant et al., 2018; Su et al., 2022). However, although maltreatment experiences can have negative consequences for the next generation, the mechanisms of risk transmission are not fully clear (Madigan et al., 2019; Van IJzendoorn et al., 2020; Zuravin et al., 1996). In this study, we explore whether maternal mental health and mother-child interaction during infancy and middle childhood might explain the intergenerational transmission of maltreatment consequences.

From a developmental psychopathology perspective, a comprehensive framework of risk and protective factors helps explain how adverse life events and maltreatment can disrupt an individual's healthy developmental trajectory (Cicchetti & Toth, 2009; Masten & Cicchetti, 2010; Sroufe, 2007). Several potential mechanisms have been proposed to explain this developmental cascade, which cumulatively influence and shape development across multiple domains (Masten & Cicchetti, 2010). Most prominently, MCM may affect child outcomes through its influence on parenting behaviors, parent-child attachment, and maternal mental health (Loheide-Niesmann et al., 2024; Ma et al., 2022).

1.1. Parenting, parent-child attachment, and maternal mental health as mediation pathways

Considering the long-lasting consequences of childhood maltreatment in mothers, it is important to examine *how* these effects may extend to the next generation. One mechanism through which these consequences can manifest is parenting, when the infant's signals and cues for contact and comfort may trigger inadequate parenting behaviors (Leite Ongilio et al., 2023), that interfere with the promotion of secure attachment (Madigan et al., 2023). Consequently, mothers who experienced maltreatment seem to have less positive parenting strategies (Greene et al., 2020), represented by being less supportive (Liu et al., 2024) and being less emotionally available, especially during the first years of the child's life (Fuchs et al., 2015; MacMillan et al., 2021). These difficulties have been reflected in studies showing that mother-child interactions might be impaired by mothers' reduced capacity to respond sensitively to infants (Girod et al., 2023; Pereira et al., 2012). Accordingly, systematic reviews have also found small but statistically significant associations between MCM and parenting stress (Lotto et al., 2023), harsh and intrusive discipline (Greene et al., 2020), disrupted mother-child interaction (Khouri et al., 2022), and dysfunctional caregiving represented by less warmth and more negative behavior of mothers towards offspring (Buisman et al., 2018).

Along the same line, recent research has increasingly examined how maltreatment experiences in one's childhood can affect parent-child attachment later on when transitioning into parenthood. A recent systematic review by Souch et al. (2022) reported on seven studies and indicated that MCM was associated with less optimal observed mother-infant interaction, although the findings were statistically significant in only two studies. However, these studies had relatively small sample sizes, with the largest comprising 255 mother-infant dyads (Juul et al., 2016). Indeed, the lack of power may have played a role, as a very recent meta-analysis combining the results of 25 studies on MCM (including one study that was also part of the review by Souch et al., 2022) found a weak but significant effect. Specifically, these studies suggest that MCM is associated with child attachment insecurity, although no significant associations were found for child attachment disorganization (Sirparanta et al., 2025). Thus, mothers' experiences of maltreatment do not appear to be decisive for children's attachment, leaving open the question about which additional variables might explain whether and how these experiences are transmitted across generations.

A few studies dug further into other potential variables that may, in turn, affect parenting, such as maternal mental health problems, particularly depression, which may be one of the key mechanisms linking MCM with parenting and attachment (Khan & Renk, 2018). Indeed, maternal depression has been associated with impairments in mother-infant bonding (Carlone & Milan, 2021; Chau et al., 2023; Kolk et al., 2021), maternal sensitivity (Bodeker et al., 2019), less responsive parenting behaviors (Michl-Petzing et al., 2019), and greater maternal emotional dysregulation, which is also linked to insecure infant attachment (Langevin et al., 2023). Furthermore, a meta-analysis of Loheide-Niesmann et al. (2024) provided relatively robust evidence for the mediating role of maternal depressive symptoms in explaining the long-lasting consequences of MCM in the next generation. Taken together, these studies suggest that the effects of maltreatment are not deterministic, nor do they directly extend to the next generation. Rather, proximal factors such as maternal mental health may modify mother-child interactions and, in turn, affect child outcomes. This perspective reflects a dynamic and cumulative system where changes in one area spill over and affect outcomes in others. In this developmental cascade, the mother's mental health—originally influenced by her own childhood maltreatment—can, in turn, disrupt family relationships and parenting practices. However, a developmental cascade framework that explains how these variables impact child well-being over time has rarely been examined (Alto et al., 2021; Khan & Renk, 2018).

1.2. Current study

Although substantial evidence supports the intergenerational transmission of maltreatment, research continues to explore how mothers' childhood experiences of maltreatment may influence infant attachment and maternal sensitivity. Most available evidence comes from cross-sectional studies with relatively small samples from early childhood (Leite Ongilio et al., 2023), even though the

intergenerational transmission of consequences may extend into the school years and beyond (Bravo, Kim, et al., 2023; Enlow et al., 2018; Loheide-Niesmann et al., 2024; Moog et al., 2023). Besides, among studies with observational measures, most examined early infancy in at risk samples (Vaillancourt et al., 2017), leaving open the question of whether the effects also hold within the general population. The present study aimed to deepen our understanding of how mothers' childhood maltreatment experiences may affect the quality of interaction with their children across development. By examining longitudinal pathways from maternal childhood maltreatment to children's emotional and behavioral problems through middle childhood, the study moves from establishing associations to identifying potential mechanisms of intergenerational risk and resilience. Specifically, investigating maternal psychopathology as a risk factor and observed maternal sensitivity and attachment quality as protective factors may help clarify how early adverse experiences may influence parenting and child development. These findings can inform the development of preventive interventions by highlighting modifiable targets, such as improving maternal mental health and strengthening sensitive caregiving and secure attachment relationships. Ultimately, this work contributes to identifying opportunities to interrupt the intergenerational transmission of adversity and promote healthy developmental outcomes for both mothers and their children. This perspective shifts the focus from deterministic models of intergenerational transmission towards one that recognizes resilience and the potential for positive developmental change. We hypothesize a direct positive association between maternal childhood maltreatment and children's emotional and behavioral problems at age 10. We also expect that infant attachment during the first year, maternal sensitivity (assessed at four time points between ages 1 and 10), and maternal psychopathology (measured during pregnancy and in middle childhood) explain part of this association.

2. Methods

2.1. Design and study population

The present study was part of the Generation R Study, a population-based cohort from fetal life onwards (Kooijman et al., 2016). The participants eligible for this study were pregnant women living in the study area in Rotterdam, the Netherlands, with an expected delivery date between April 2002 and January 2006. The Medical Ethical Committee of the Erasmus University Medical Center, Rotterdam, approved the study. For all participants, written informed consent was obtained. In total, 9778 mothers were enrolled (response rate: 61%). The current study was conducted using the Generation R Focus Cohort, which is a subsample of children of Dutch national origin. This ethnically homogeneous subsample was selected to reduce potential confounding or effect modification by ethnicity and to enable more in-depth analyses that could not be applied to the full cohort because of time, financial, and logistical constraints; further details on the study design are provided elsewhere (Jaddoe et al., 2006). Due to a focus on Dutch origin only, this sample is less representative of the general population and presents with lower risks and fewer behavioral and health problems than the general population (Jaddoe et al., 2006). In total 1247 parent-child dyads were enrolled in this subsample. Of them, 1106 parent-child dyads gave consent for participation in the next phase when the child was 10 years. Among these, 881 Strange Situation assessments were conducted. The final sample included all children with available and completed information on attachment, comprising 832 children. The measures were collected at different time points: Maternal history of maltreatment and maternal psychopathology were measured prenatally using a self-administered questionnaire; infant attachment was observed during lab visits when children were 1 year old; maternal sensitivity was observed during lab visits at child ages 1, 3, 4, and 10 years. Finally, at 10 years, mothers completed the Child Behavior Checklist and, again, the maternal psychopathology questionnaire.

2.2. Measures

2.2.1. Maternal childhood maltreatment

The Childhood Trauma Questionnaire (CTQ) was used to assess mothers' history of childhood maltreatment. This retrospective self-report, consisting of 34 items, was filled out by mothers to measure the extent to which they experienced maltreatment before age 18. Mothers rated the items on a 5-point Likert scale from "never true" to "very often true". For this study, we created a dichotomous variable (moderate to severe = 1; not severe = 0) using the cut-off based on Bernstein et al. (2003) if a person scored above the cut-off on any of the five subscales of emotional abuse (score ≥ 13), physical abuse (score ≥ 10), sexual abuse (score ≥ 10), emotional neglect (score ≥ 30), and physical neglect (score ≥ 16), they were assigned a severity score of 1. Additionally, a co-occurrence score was created by summing the number of subscales above the cut-off, to describe the coexistence of abuse types. The CTQ has demonstrated good test-retest reliability (Bernstein et al., 1997), and is commonly used to measure maltreatment in retrospective studies as a sensitive and valid screening questionnaire (Bernstein et al., 2003).

2.2.2. Maternal psychopathology

Maternal general psychopathology was self-reported in a questionnaire during pregnancy and at the age of 10 years, using the validated Dutch version of the Brief Symptom Inventory (BSI; (De Beurs, 2009). This is a 53-item self-report questionnaire in which mothers rated the extent to which each item described her feelings in the past week. The rating scale of the items was 0 (not at all) to 4 (extremely). In this study we used the overall global severity index, by summing all 53 items and dividing by the total number of items to which the individual responded. The internal consistency was excellent ($\alpha = 0.96$).

2.2.3. Infant attachment

At 14 months, the Strange Situation Procedure (SSP; Ainsworth, 1978) was used to measure the quality of attachment. The SSP

consists of seven episodes of 1 to 3 min each and is designed to evoke mild stress in the infant to trigger attachment behavior. Four attachment behaviors towards the parent were coded in the reunions: (1) proximity and contact seeking, (2) contact maintaining, (3) avoidance of proximity and contact, and (4) resistance to contact and comforting (Ainsworth, 1978; Main & Solomon, 1990).

Infants' behavior was coded as secure, insecure-avoidant, or insecure-resistant based on whether children were able to find comfort in their parent when they returned (Ainsworth, 1978). Furthermore, children were coded as disorganized or non-disorganized. Children with a disorganized attachment style showed an inconsistent way of coping with the stress during the SSP, for example crying during separation, but avoiding the parent upon return (Main & Solomon, 1990). Reliable coders (AT and ML) performed the coding of the infants' behavior; they were trained and qualified to code infant behavior from SSPs at the University of Minnesota and supervised by Marian Bakermans and Marinus van IJzendoorn, both of whom coded the difficult tapes. Coders were blind to results on all other measurements. Inter-coder agreement was calculated on 70 SSPs. For ABCD classification, inter-coder agreement was 77% ($\kappa = 0.63$), agreement on security vs insecurity was 83% ($\kappa = 0.66$), and agreement on disorganization was 87% ($\kappa = 0.64$) (Luijk et al., 2010).

Additionally, we calculated a continuous score for secure attachment based on Richter's security score, slightly modified by Van IJzendoorn and Kroonenberg (1990). The score was based on the child's interactive behaviors, as coded in the reunion episodes, with higher scores indicating more secure attachment (Galbally et al., 2022; Naber et al., 2007). This score has shown a strong association with secure versus insecure attachment classifications, correctly predicting approximately 90% of cases (Van IJzendoorn & Kroonenberg, 1990). The intercoder reliability for the continuous secure attachment score in the study sample was 0.88 (Lucassen et al., 2018).

For this study, we used the four attachment classifications (secure, insecure-avoidant, insecure-resistant, and disorganized) to describe the sample and the continuous attachment security score for the model, as well as secure versus insecure category.

2.2.4. Observed maternal sensitivity

Maternal observational measures were collected at 4 time points. Namely, the assessments were administered and recorded by trained research assistants in the lab when children were 1, 3, 10 years, and at home at 4 years. The recordings were coded by research assistants who had extensive training to achieve intercoder reliability. All assistants were regularly supervised.

At child age 1 year, maternal sensitivity was observed during five minutes of free play. Maternal sensitivity was coded using Ainsworth's 9-point rating scales for *Sensitivity* and *Cooperation* (Ainsworth et al., 1974). The intraclass correlation (ICC) for intercoder agreement was 0.79 for Sensitivity scale and 0.69 for Cooperation scale ($n = 24$). In the study sample, the Sensitivity and Cooperation scales correlated strongly ($r = 0.71$).

At 3 and 4 years, maternal sensitivity was observed when mother-child dyads performed two 3-min tasks that were too difficult for the child: building a tower and an Etch-a-Sketch task. At 10 years, only the Etch-a-Sketch task was performed (6 min). Maternal sensitivity was coded using the revised Erickson 7-point rating scales for *Supportive Presence* and *Intrusiveness* (Egeland et al., 1990). At 3 years, the total ICCs for the subscales were 0.75 on average for the tower task (range 0.73–0.77, $n = 53$) and 0.79 on average for the etch-a-sketch task (range 0.65–0.93, $n = 55$). At 4 years, the ICCs on average for both tasks were 0.80 (range 0.63–0.87, $n = 40$) (Lucassen et al., 2015). At 10 years, the intercoder reliability was established in 60 cases, with an average ICC of 0.89 (range 0.86–0.91). In the study sample, the supportive presence and intrusiveness scales correlated moderately with each other (3y, 4y, and 10y: $r = 0.43, 0.51$, and 0.40 , respectively).

In each wave, a mean sensitivity score was computed by averaging the two scores for each subscale. Specifically, at 1 year, we summed the Sensitivity and Cooperation subscales, and at 3, 4, and 10 years, the Supportive Presence and reverse-coded Intrusiveness subscales. Following previous work using the same approach (Bravo, Cárcamo, et al., 2023; Kok et al., 2015; Lucassen et al., 2015; Szekely et al., 2014), we calculated these composite scores of the sensitivity subscales based on the moderate to high correlations between the subscale scores within each task.

2.2.5. Emotional and behavioral problems

At 10 years, the Child Behavior Checklist (CBCL; Achenback & Rescorla, 2000) was used to assess parent-reported internalizing (emotional) and externalizing (behavioral) problems. The CBCL version 6–18 years contains 112 items rated on a 3-point scale: 0 (*not true*), 1 (*somewhat or sometimes true*), and 2 (*very true or often true*). Raw scores for internalizing (32 items) and externalizing (35 items) problems were created by summing the items. The psychometric properties of the Dutch CBCL are well established (Verhulst & van der Ende, 2013). In this sample, the reliability for the internalizing scale was good ($\alpha = 0.84$) as well as for the externalizing scale ($\alpha = 0.87$).

2.2.6. Covariates

Birth records were used to determine child date of birth and sex. Maternal age was assessed by postal questionnaire at intake during pregnancy. In addition, because externalizing behavior tends to be higher with more siblings (Olson et al., 2020), we included a measure of the number of children in the model as a covariate.

2.2.7. Sociodemographic information

For descriptive purposes, we added sociodemographic information about family income and maternal education, which were obtained via self-report questionnaires during pregnancy. Family income was defined as the total monthly net income of the mother's household during the enrolment period of this cohort. The income was classified into two categories: "low" ($\leq \text{€}2200$) and "high" ($\geq \text{€}2200$). Maternal education was also included to characterize the sample. It was classified into two categories: "low" (no education,

primary education, or secondary phase 1 finished, secondary phase 2 finished), and “high” (higher vocational training or a university degree finished) (CBS, 2017).

2.3. Statistical analysis

Sample characteristics and bivariate correlations between core study variables were examined using the Statistical Package for the Social Sciences (SPSS) Version 20.0 (IBM Corporation). As a second step, we conducted path analysis (PA) to test a developmental cascade model evaluating the longitudinal associations between a maternal history of childhood maltreatment and offspring internalizing and externalizing problems at 10 years of age. Theoretically, this model proposed a sequential trajectory wherein early stressful life events (maternal childhood maltreatment) predict subsequent maternal mental health, which in turn interferes with both maternal sensitivity and infant attachment security, ultimately relating to subsequent child emotional and behavioral outcomes at age 10. A conceptual schematic overview of these hypothesized associations over time is displayed in Fig. S1.

To formally specify the structural model, maternal psychopathology, maternal sensitivity, infant attachment, and both child internalizing and externalizing problems were specified as endogenous variables, each regressed on their chronologically preceding predictors in the cascade. Consistent with the model design, covariates were included as control variables, with the covariance between the primary exogenous predictor and child sex fixed to zero. To examine whether infant attachment (continuous score), maternal sensitivity, and maternal psychopathology mediated the association between maternal childhood maltreatment and child outcomes, specific indirect effects, total indirect effects, and total effects were explicitly specified and evaluated using the model indirect command in Mplus. Additionally, a secondary analysis was done substituting the continuous attachment score with a categorical classification (secure vs. insecure) to assess potential differences across measurement types.

All path models were estimated in Mplus using Full Information Maximum Likelihood with robust standard errors (MLR) to simultaneously account for multivariate non-normality and missing data within the final sample of 832 participants (Enders &

Table 1
Descriptives of the study sample.

Variable	N	M (SD) or N (%)	Min	Max
Maternal age at intake (in years)	832	31.9 (3.8)	16.22	43.31
Siblings, % one or more	832	149 (17.8%)		
Child age at different assessments (in years)				
Visit around 1 year	832	1.2 (0.9)	1	1.72
Questionnaire around 10 years	785	9.8 (0.4)	8.53	11.50
Child sex, % boys	832	421 (50.6%)		
Family income, % high	832	664 (81.0%)		
Maternal education, % high	832	746 (90.6%)		
Child Behavior Checklist			0	32
Internalizing problems mean score	679	4.5 (4.9)		
Externalizing problems mean score	679	3.7 (4.4)	0	34
Infant attachment, %	832			
Avoidant		104 (12.5%)		
Secure		417 (50.1%)		
Resistant		121 (14.5%)		
Disorganized		170 (20.4%)		
Infant secure attachment score	832	0.27 (2.6)	−8.23	5.81
Maternal childhood maltreatment, % above cut-off*				
Emotional abuse	758	48 (6.3%)		
Physical abuse	764	21 (2.7%)		
Sexual abuse	758	26 (3.4%)		
Emotional neglect	764	85 (11%)		
Physical neglect	764	16 (2.1%)		
Maternal childhood maltreatment, any abuse, % yes	765	120 (15.7%)		
Co-occurrence of maternal childhood maltreatment types, %	764			
None		645 (84.3%)		
One type		74 (9.7%)		
Two types		27 (3.5%)		
Three types		12 (1.6%)		
Four types		3 (0.5%)		
Five types		4 (0.5%)		
Maternal sensitivity mean score (Ainsworth scale [#]) at 1 year	772	6.3 (1.1)	1	7
Maternal sensitivity mean score (Erickson scale [#]) at 3 years	718	4.0 (1.0)	1	7
Maternal sensitivity mean score (Erickson scale [#]) at 4 years	542	3.5 (1.0)	1	7
Maternal sensitivity mean score (Erickson scale [#]) at 10 years	707	3.9 (1.1)	1	7
Maternal psychopathology mean item score during pregnancy	775	0.18 (0.2)	0	2.04
Maternal psychopathology mean item score at 10 years	677	0.20 (0.2)	0	1.71

Note:

* Based on Childhood Trauma Questionnaire.

range Ainsworth scale 1–9 points; range Erickson scale 1–7 points.

Bandalos, 2001). Missing data per variable in the final sample was low to moderate, remaining below 35%. The statistical significance of the direct and indirect parameter estimates was evaluated using a bootstrapping approach with 5000 resamples to generate bias-corrected confidence intervals (Bollen & Stine, 1992; Shrout & Bolger, 2002). Model fit was evaluated with the Maximum Likelihood chi-square test of exact fit (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root-Mean-Square Error of Approximation (RMSEA). Good model fit was achieved by a non-significant chi-square value ($p > .05$) and if TLI and CFI were ≥ 0.90 and RMSEA ≤ 0.08 (Hu & Bentler, 1999; Marsh et al., 2004).

3. Results

The characteristics of the sample are shown in Table 1. Half of the children were boys (50.1%). Moreover, the majority of the sample had high family income (81.0%) and high maternal education (90.6%). Among the mothers, 84.3% never experienced abuse, while 9.7% of them experienced one type of abuse in the past. A small group of mothers (6%) experienced two or more types of abuse in their childhood. Correlations among the variables in the study are presented in Table 2. The different types of maternal childhood maltreatment were positively correlated with each other (e.g., Emotional and Physical abuse, $r = 0.51$). The different types of maternal childhood maltreatment were positively correlated with maternal psychopathology during pregnancy and at 10 years, as well as with child internalizing and externalizing problems, except for physical abuse with externalizing problems. To assess potential non-response bias, a non-response analysis was conducted by comparing respondents and non-respondents across known demographic variables. Independent *t*-tests revealed significant age differences, $t(1104) = 2.81, p = .005$, in which non-responding mothers ($n = 274$) were younger than included mothers ($n = 832, M = 31.10$ vs $M = 31.89$). Chi-square tests of independence also indicated significant differences in educational level, $\chi^2(1, N = 1106) = 11.71, p < .001$, in which non-responding mothers more often had lower educational levels (17.0% vs 9.4%) although no differences in income were found, $\chi^2(1, N = 1106) = 2.84, p = .105$ (high income 76.1% vs 81.0%). These differences point to some selection bias, although absolute differences were small.

3.1. Structural model

The full model is shown in Fig. 1. The specified path model was evaluated using a sample size of $N = 832$. A maximum likelihood chi-square test indicated an excellent global fit to the empirical data, $\chi^2(16) = 16.30, p = .432$. Because the *p*-value was non-significant ($p > .05$), the theorized model structure is statistically indistinguishable from the observed covariance matrix. This conclusion was supported by alternative descriptive fit indices representing thresholds for excellent model fit (CFI = 0.99; TLI = 0.98; RMSEA = 0.02). There was a significant direct link between maternal childhood maltreatment (MCM) and children's externalizing behavior ($\beta = 0.11, SE = 0.04; p < .05$), internalizing problems ($\beta = 0.12, SE = 0.04; p < .05$), as well as with maternal psychopathology during pregnancy ($\beta = 0.19, SE = 0.07; p < .05$). However, no significant links were found with attachment or maternal sensitivity. Additionally, higher levels of maternal psychopathology at 10 years were linked to more internalizing and externalizing problems (see Fig. 1 and Table 3). Maternal sensitivity at 1 year was directly and positively related to externalizing problems ($\beta = 0.07, SE = 0.04; p < .05$), while maternal sensitivity at 10 years was negatively associated with internalizing problems ($\beta = -0.09, SE = 0.03; p < .05$). A secondary analysis with attachment as a categorical variable (Secure v/s insecure) showed similar, non-significant associations between attachment and the other variables incorporated in the model (Fig. S2 and Table S1).

Additionally, we found a significant indirect effect from MCM to externalizing problems through the path that includes maternal psychopathology during pregnancy and at 10 years ($\beta = 0.29, 95\% \text{ CI } [0.16, 0.50]$). A similar path via maternal psychopathology during pregnancy and at 10 years ($\beta = 0.33, 95\% \text{ CI } [0.18, 0.56]$) was found for internalizing problems.

4. Discussion

This study investigated the longitudinal association of maternal childhood maltreatment and offsprings' emotional and behavioral problems in the first 10 years of life. We expected that early components of the child–parent relationship, such as attachment and maternal sensitivity, would mediate this relationship. However, our hypotheses were only partially supported, in which maternal psychopathology emerged as an important factor, whereas mother–child interaction played a comparatively more minor role.

4.1. Direct and indirect associations between MCN and emotional and behavioral problems

Our work extends prior research in several ways. The results indicated a direct association of maternal childhood maltreatment with children's emotional and behavioral problems in middle childhood. This finding is comparable with other studies pointing to the intergenerational effect of maltreatment experiences in mothers (Airikka et al., 2023; Moog et al., 2023; Plant et al., 2018; Su et al., 2022). Moreover, we found higher levels of maternal psychopathology among mothers with maltreatment experiences, which in turn were associated with increased emotional and behavioral problems of their children. This finding, together with previous research (Greene et al., 2020; Loheide-Niesmann et al., 2024), highlights the relevance of maternal mental health as a long-lasting consequence of negative life events such as maltreatment experiences. Consistent with the longitudinal study by Clemens et al. (2025), it is important to note that our findings suggest that the effect of maternal mental health problems may be cumulative, as maternal psychopathology during pregnancy was strongly associated with maternal psychopathology at 10 years, and this pathway, in turn, mediated the association between MCM and child outcomes. Among the mechanisms examined in the model, maternal mental health emerged as a stronger mediator than maternal sensitivity or attachment. This suggests that maternal mental health is an important

Table 2
Bivariate correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Secure score (attachment)	1																
2. Emotional abuse	−0.02	1															
3. Physical abuse	0.02	0.61**	1														
4. Sexual abuse	0.00	0.36**	0.44**	1													
5. Emotional neglect	−0.03	0.57**	0.37**	0.23**	1												
6. Physical neglect	−0.04	0.48**	0.39**	0.36**	0.40**	1											
7. Abuse (yes vs. no)	−0.03	0.63**	0.41**	0.44**	0.68**	0.41**	1										
8. Sensitivity at 1 year	0.05	−0.04	−0.06	0.00	−0.05	0.02	−0.07	1									
9. Sensitivity at 3 years	0.05	−0.03	0.01	−0.03	−0.11**	−0.02	−0.05	0.20**	1								
10. Sensitivity at 4 years	0.03	−0.01	0.02	0.03	−0.06	−0.02	−0.01	0.14**	0.37**	1							
11. Sensitivity at 10 years	0.04	−0.02	0.00	−0.01	−0.02	−0.03	0.01	0.11**	0.27**	0.31**	1						
12. Maternal psychopathology pregnancy	−0.05	0.28**	0.20**	0.18**	0.23**	0.21**	0.19**	−0.06	−0.05	−0.04	−0.03	1					
13. Maternal psychopathology at 10 years	−0.05	0.18**	0.10*	0.10**	0.17**	0.14**	0.15**	−0.01	0.02	0.01	0.00	0.47**	1				
14. Internalizing problems at 10 years	−0.05	0.20**	0.13**	0.15**	0.13**	0.08*	0.17**	0.05	0.00	0.06	−0.05	0.28**	0.36**	1			
15. Externalizing problems at 10 years	−0.04	0.18**	0.07	0.13**	0.13**	0.14**	0.16**	−0.02	−0.08*	−0.04	−0.11**	0.22**	0.32**	0.52**	1		
16. Child sex (boy vs. girl)	0.04	−0.01	0.00	−0.03	0.02	0.02	0.01	0.09*	0.08*	0.02	0.07	−0.09*	−0.06	−0.06	−0.09*	1	
17. Siblings (yes vs. no)	0.03	0.04	0.00	−0.02	0.00	−0.02	0.01	0.04	0.03	0.03	0.04	−0.03	−0.06	−0.05	−0.04	0.04	1

P value: **. < 0.01; * . 0.05.



Notes: * $p < .05$; ** < 0.01 . Numeric values are standardized path regression coefficients. Non-significant paths are not shown in the figure. Child sex coded boys = 1, girls = 2.

Notes: * $p < .05$; ** < 0.01 . Numeric values are standardized path regression coefficients. Non-significant paths are not shown in the figure. Child sex coded boys = 1, girls = 2.

Table 3

Standardized path coefficients for the model of maternal childhood maltreatment, parent-child mediators and children's internalizing and externalizing problems.

Independent	Dependent	B	SE	p value
MCM	Child externalizing problems	0.11	0.05	0.03
Maternal sensitivity at 1 year	Child externalizing problems	0.01	0.04	0.79
Maternal sensitivity at 3 years	Child externalizing problems	-0.05	0.04	0.25
Maternal sensitivity at 4 years	Child externalizing problems	-0.00	0.04	0.95
Maternal sensitivity at 10 years	Child externalizing problems	-0.09	0.04	0.03
Maternal psychopathology during pregnancy	Child externalizing problems	0.09	0.05	0.09
Maternal psychopathology at 10 years	Child externalizing problems	0.26	0.05	0.00
Secure attachment (score)	Child externalizing problems	-0.01	0.04	0.84
Child sex	Child externalizing problems	-0.05	0.04	0.32
Siblings	Child externalizing problems	-0.04	0.09	0.65
MCM	Child internalizing problems	0.12	0.05	0.01
Maternal sensitivity at 1 year	Child internalizing problems	0.07	0.03	0.04
Maternal sensitivity at 3 years	Child internalizing problems	-0.10	0.04	0.73
Maternal sensitivity at 4 years	Child internalizing problems	0.08	0.05	0.11
Maternal sensitivity at 10 years	Child internalizing problems	-0.07	0.04	0.08
Maternal psychopathology during pregnancy	Child internalizing problems	0.15	0.06	0.01
Maternal psychopathology at 10 years	Child internalizing problems	0.27	0.06	0.00
Secure attachment (score)	Child internalizing problems	-0.02	0.04	0.53
Child sex	Child internalizing problems	-0.03	0.04	0.42
Siblings	Child internalizing problems	-0.07	0.09	0.46
MCM	Maternal psychopathology during pregnancy	0.19	0.05	0.00
MCM	Maternal psychopathology at 10 years	0.08	0.05	0.13
Maternal psychopathology during pregnancy	Maternal psychopathology at 10 years	0.48	0.06	0.00
MCM	Secure attachment (score)	-0.02	0.04	0.71
Maternal psychopathology during pregnancy	Secure attachment (score)	-0.05	0.03	0.09
Maternal sensitivity at 1 year	Secure attachment (score)	0.05	0.03	0.16
MCM	Maternal sensitivity at 1 year	-0.06	0.04	0.15
Maternal psychopathology during pregnancy	Maternal sensitivity at 1 year	-0.04	0.04	0.26
Child sex	Maternal sensitivity at 1 year	0.08	0.04	0.02
Siblings	Maternal sensitivity at 1 years	0.03	0.09	0.39
Maternal sensitivity at 1 year	Maternal sensitivity at 3 years	0.20	0.04	0.00
MCM	Maternal sensitivity at 3 years	-0.03	0.04	0.46
Maternal psychopathology during pregnancy	Maternal sensitivity at 3 years	-0.04	0.04	0.40
Child sex	Maternal sensitivity at 3 years	0.06	0.04	0.08
Siblings	Maternal sensitivity at 3 years	0.02	0.04	0.60
Maternal sensitivity at 1 year	Maternal sensitivity at 4 years	0.05	0.04	0.23
Maternal sensitivity at 3 years	Maternal sensitivity at 4 years	0.36	0.04	0.00
MCM	Maternal sensitivity at 4 years	0.02	0.05	0.69
Maternal psychopathology during pregnancy	Maternal sensitivity at 4 years	-0.04	0.05	0.40
Child sex	Maternal sensitivity at 4 years	-0.02	0.40	0.62
Siblings	Maternal sensitivity at 4 years	0.02	0.09	0.68
Maternal sensitivity at 1 year	Maternal sensitivity at 10 years	0.04	0.04	0.30
Maternal sensitivity at 3 years	Maternal sensitivity at 10 years	0.17	0.04	0.00
Maternal sensitivity at 4 years	Maternal sensitivity at 10 years	0.24	0.05	0.00
MCM	Maternal sensitivity at 10 years	0.02	0.04	0.60
Maternal psychopathology during pregnancy	Maternal sensitivity at 10 years	-0.01	0.04	0.80
Maternal psychopathology at 10 years	Maternal sensitivity at 10 years	0.01	0.05	0.91
Child sex	Maternal sensitivity at 10 years	0.05	0.04	0.22
Siblings	Maternal sensitivity at 10 years	0.03	0.04	0.50
Internalizing problems	WITH Externalizing problems	0.45	0.04	0.00

Note: #MCM: Maternal childhood maltreatment. Significant paths are in bold.

variable in the context of maltreatment histories, particularly among prospective parents. Accordingly, preventive interventions should begin early. Although we could not demonstrate an association between maternal mental health and attachment or sensitivity, previous research has shown that postpartum depression in mothers with a history of maltreatment was associated with problematic mother–infant bonding early in infancy (Vogel et al., 2025). Consistent with our results, this finding highlights the clinical importance of fostering resilience and strengthening protective factors.

4.2. Infant attachment and maternal sensitivity

Contrary to our expectations, early relational processes such as infant attachment and maternal sensitivity did not explain the relationship between maternal childhood maltreatment and child emotional and behavioral problems. This finding aligns with the results from recent reviews (Leite Ongilio et al., 2023; Souch et al., 2022) and a recent meta-analysis (Sirparanta et al., 2025), which together hint at a weak association between MCM and offspring attachment that was only statistically significant when combining the results of 25 different studies. Other studies have also found no significant association with maternal sensitivity (Bodeker et al., 2019;

Stacks et al., 2014) and no significant mediation of infant insecure attachment (Ahlf-Dunn et al., 2022) or disorganized attachment in the link between MCM and later child psychopathology (Alto et al., 2021). In this regard, children of mothers who report exposure to such events do not appear to be at increased risk of establishing insecure relationships with their mothers. Abuse may affect the parent–child relationships and offspring attachment quality only when the experiences remain unresolved or unprocessed (Verhage et al., 2016). Indeed, evidence regarding the association between MCM and parenting is inconsistent; for instance, Morelen and colleagues (2018) found that MCM exposure predicted increased maternal positive affect during mother–infant interactions. Thus, parenting might not necessarily be affected by MCM, suggesting opportunities for breaking the cycle of childhood maltreatment (Sirparanta et al., 2025).

One possible explanation for the lack of significance is that infant attachment in a high socioeconomic context, as in our study, may not be affected by MCM. This might suggest that past experiences of maltreatment in mothers are only a single (parent-related) risk factor, and in itself not enough to affect the development of an attachment relationship (Assink et al., 2018). A context of multiple risk factors might be associated with more severe consequences, as past research has demonstrated in high-social-risk samples (Stacks et al., 2014). In addition, the limited number of mothers with maltreatment experiences in the past in our sample and the relatively healthy, affluent nature of our sample may explain why this association was not evident. In this way, maternal sensitivity and attachment seem to be affected by more than only the experience of maltreatment, or perhaps the effect of such experiences might be neutralized by the presence of certain protective factors. For instance, based on the findings of Swerbenski et al. (2023), trauma resolution moderates the associations between maternal physical neglect and sensitive parenting, having a protective-enhancing impact on maternal sensitivity. Thus, the inclusion of more protective factors might enhance the understanding of the lack of significance in this sample, as in fact, breaking the intergenerational cycle of abuse is the most common outcome for mothers who survive maltreatment experiences in their childhood (Morelen et al., 2018).

Past research has found that parenting practices displayed by mothers who experienced maltreatment in childhood may be key in buffering the consequences for the next generation (Riva Crugnola et al., 2019). Our null findings for maternal sensitivity might be explained by other parenting practices that were not included in this study, which may buffer the effect of maltreatment experiences and prevent the cycle of abuse from continuing. Consistent with recent evidence of a meta-analysis from Loheide-Niesmann et al. (2024), mixed findings in the intergenerational transmission of the effects of maternal childhood maltreatment suggest that parenting is one component of a broader network of mediating and/or moderating factors involved in this transmission. Although we have already considered multiple factors, future research should ideally include additional potential mediating variables.

Despite the non-significant direct associations between maternal childhood maltreatment and relational outcomes such as attachment and maternal sensitivity, we found evidence of an association between maternal sensitivity during infancy and the presence of internalizing problems during middle childhood. However, the association was positive, indicating that higher levels of maternal sensitivity at 1 year were associated with the presence of internalizing problems at 10 years. This counterintuitive result may be related to the large gap between assessments, particularly given that maternal sensitivity at 10 years was negatively associated with externalizing problems. This finding underscores that parental sensitivity may change slightly over time and that it may serve as a protective factor in child development, particularly in the presence of indirect risk factors like a mother's history of childhood maltreatment (Dryer et al., 2022).

In addition, this result is similar to a previous study using the same sample, in which Kok et al. (2013) found an association between maternal sensitivity at 1 year and internalizing problems at 6 years old. This suggests that the association between internalizing problems and maternal sensitivity in the early years may be consistent over time. Moreover, the association may be child-driven, in which child variables such as temperament elicit more maternal sensitivity and also relate to internalizing behavior later in development. Indeed, Kok et al. (2013) found a small but positive effect of internalizing symptoms on maternal sensitivity during the preschool period in an American sample. Additionally, another study found evidence for a child-driven effect of child externalizing problems on maternal sensitivity from ages 4 to 11 (Wang et al., 2013). These findings emphasize the complex interactional nature of parent–child relationships, and future studies are encouraged to acknowledge potential bi-directional effects.

4.3. Strengths and limitations

Our study has several strengths, including the use of observational measures to assess infant attachment and maternal sensitivity from infancy to middle childhood. Additionally, the longitudinal design enabled us to investigate the long-term effects of the MCM. Nevertheless, this study has several limitations that should be noted. First, this study is based on a subsample of mothers of Dutch origin with a relatively high socioeconomic status. Therefore, the generalizability and the interpretation of the results must be done with caution due to the sample characteristics. In addition, because the sample was quite affluent, we found fewer problems, low variability in maternal and child mental health, and a low rate of maltreatment, which might have lowered the power of the data to detect statistically significant differences. Second, this study did not include fathers. Thus, we could not infer whether maltreatment experiences, attachment, or paternal sensitivity among fathers are associated with children's well-being, or what the role of fathers might be in the intergenerational transmission of MCM consequences. As such, we were not able to identify the potential buffering role of paternal attachment and sensitivity, or if the joint effect of both parents dilutes the association between MCM and child outcomes. Third, the retrospective report of maltreatment experiences could be affected by the capacity of mothers to remember maltreatment events, potentially leading to under- or over-reporting those experiences. This could lead to a potential issue between objective and subjective measurements of maltreatment. However, even in the absence of an objective measure of maltreatment, the subjective experience provided by participants can explain the subsequent presence of psychopathology, thus making it a reliable tool to measure maltreatment in the past (Danese & Widom, 2023). Fourth, another limitation is that we did not include other variables that may

explain the intergenerational transmission of maltreatment, such as genetic factors. Past research has found evidence for a moderating effect of genes in the association between a mother's history of abuse and offspring disorganized attachment (Ludmer et al., 2018). We cannot infer on the potential genetic effect in our study, and suggest future studies to use a prospective design including multiple variables to examine such complex interactions. Finally, this study did not include information on the broader social context. As indicated, it lacked information on the role of the child's father, but also lacked information on other social support systems, such as family, friends, or neighbors. Further research should expand the scope of mother-child interactions and include variables related to the immediate support network that the family system might have.

5. Conclusions

In conclusion, our study substantiates the long-term consequences of maternal childhood maltreatment on offspring's well-being up until middle childhood. Moreover, our results imply that the associations between maternal childhood maltreatment and children's well-being are mediated by maternal psychopathology. This finding suggests that one of the mechanisms to intervene on is maternal psychopathology, which can be addressed early, even before the child is born. In this line, this might offer preventive opportunities to break the intergenerational transmission of MCM and pre-existing maternal psychopathology consequences. Besides maternal psychopathology, we found no evidence that past maltreatment experiences affect the emotional attachment that mothers will build with their offspring. This may provide a message of hope and suggests that mothers with maltreatment experiences have the capacity to overcome that experience in their interactions with their offspring. This reflects the complexity of MCM and its potential consequences and suggests that multiple risk and protective factors, or at least more than we included, should be considered in conjunction to truly understand MCM consequences for the next generation.

CRediT authorship contribution statement

Patricia Bravo: Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Rodrigo Cárcamo:** Writing – review & editing, Validation, Investigation, Conceptualization. **Marian J. Bakermans-Kranenburg:** Writing – review & editing, Validation, Methodology. **Marinus H. van IJzendoorn:** Writing – review & editing, Validation, Investigation. **Pauline W. Jansen:** Writing – review & editing, Supervision, Resources, Investigation, Funding acquisition, Conceptualization.

Declaration of competing interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2026.108325>.

Data availability

Data will be made available on request.

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