Maternal Childhood Maltreatment History and Child Mental Health: Mechanisms in Intergenerational Effects

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Abstract

Objective—The objectives of this study were to examine whether a maternal history of maltreatment in childhood has a detrimental impact on young children's mental health and to test theoretically and empirically informed pathways by which maternal history may influence child mental health.

Method—Mother-child dyads ($N = 187$) were evaluated between birth and 64 months of age via home and laboratory observations, medical and child protection record reviews, and maternal interviews to assess maternal history of childhood maltreatment and microsystem and exosystem measures of the caregiving context, including child maltreatment, maternal caregiving quality, stress exposures, and social support. When the children were age 7 years, mothers and teachers reported on child emotional and behavioral problems. Analyses examined whether the caregiving context variables linked maternal maltreatment history with child emotional and behavioral problems, controlling for child sex (54% male), race/ethnicity (63% White), and family sociodemographic risk at birth.

Results—Maltreated mothers experienced greater stress and diminished social support, and their children were more likely to be maltreated across early childhood. By age 7, children of maltreated mothers were at increased risk for clinically significant emotional and behavioral problems. A path analysis model showed mediation of the effects of maternal childhood maltreatment history on child symptoms, with specific effects significant for child maltreatment.

Conclusions—Interventions that reduce child maltreatment risk and stress exposures and increase family social support may prevent deleterious effects of maternal childhood maltreatment history on child mental health.

Keywords

maternal maltreatment; intergenerational; child mental health; mechanisms

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Child maltreatment often results in disrupted emotional and behavioral patterns of functioning that persist into adulthood (De Bellis, 2001; Gunnar & Quevedo, 2007). These deficits may increase risk for poor mental health among maltreated individuals' offspring by negatively influencing various aspects of the caregiving context (Noll, Trickett, Harris, & Putnam, 2009). However, few studies have tested associations between maternal maltreatment history and child mental health (Collishaw, Dunn, O'Connor, Golding, & The Avon Longitudinal Study of Parents and Children Study Team, 2007), a notable gap given the widespread prevalence of childhood maltreatment (Edwards, Holden, Felitti, & Anda, 2003; Hussey, Chang, & Kotch, 2006) and consequent public health implications. The very limited available data suggest positive associations between a maternal history of childhood maltreatment and offspring mental health difficulties, including aggression, impulsivity, mood and anxiety disorders, posttraumatic stress disorder (PTSD), suicide attempts, and general emotional and behavioral problems as well as poorer trajectories of emotional adjustment across time (Brent et al., 2004; Brodsky et al., 2008; Collishaw et al., 2007; Dubowitz et al., 2001; Miranda, de la Osa, Granero, & Ezpeleta, 2011, 2013a, 2013b; Plant, Barker, Waters, Pawlby, & Pariante, 2013; Rijlaarsdam et al., 2014; Roberts, O'Connor, Dunn, Golding, & The ALSPAC Study Team, 2004).

Explicating mechanisms that link maternal maltreatment history to offspring mental health will inform efforts to develop interventions for at-risk families. To date, few studies have explored factors that may mediate parental maltreatment history effects on offspring mental health. Furthermore, the majority of existing studies are limited by design issues, including reliance on maternal and/or offspring report for assessing most or all variables and use of cross-sectional or retrospective designs (Collishaw et al., 2007; Rijlaarsdam et al., 2014). Additionally, some studies employed clinical samples, limiting generalizability to non-clinical populations. Importantly, the majority of studies focused on offspring mental health in preadolescent, adolescent, or adult offspring, although data strongly indicate that the caregiving context is most impactful and child mental health problems often first emerge in early childhood (Sroufe, Egeland, Carlson, & Collins, 2005). Finally, the factors that have been tested have generally not been guided by an overarching model or theory.

The current study aimed to examine associations between maternal childhood maltreatment history and child mental health and to test whether various indicators of the quality of the caregiving context in early life account for the impact of maternal maltreatment history on child mental health. Our analyses were informed by principles of developmental psychopathology within an ecological framework, particularly the tenets that mental health difficulties arise out of a developmental process that evolves over time beginning in early life and that these processes are heavily influenced by interactions with the environment at multiple contextual levels. Specifically, we tested caregiving contextual factors in infancy/toddlerhood and the preschool period at the level of the microsystem, i.e., immediate family environment, including child exposure to maltreatment and maternal caregiving quality; and at the level of the exosystem, i.e., environmental elements that have been shown to influence caregiving quality, including maternal exposure to stress/negative life events and access to social support (Egeland, Bosquet, & Levy Chung, 2002). These factors were expressly chosen because they have been shown to be both sequelae of a history of childhood maltreatment and risk factors for child mental health difficulties.

A parental history of childhood maltreatment increases the likelihood that a child will be maltreated by a parent or other perpetrator (Berlin, Appleyard, & Dodge, 2011; Brodsky et al., 2008; Egeland et al., 2002; Plant et al., 2013). Child maltreatment is associated with increased mental health difficulties, social isolation, inappropriate developmental expectations, and aggressive response biases in adulthood, all of which increase mothers' risk for engaging in abusive parenting behaviors (Berlin et al., 2011; Cicchetti & Lynch, 1993; Egeland et al., 2002; Egeland, Jacobvitz, & Sroufe, 1988). Child maltreatment, in turn, is linked to a range of internalizing and externalizing problems across the lifespan, including PTSD, anxiety, depression, suicidal ideation, substance abuse, dissociative disorders, disruptive behavior disorders, and personality disorders (Afifi, Brownridge, Cox, & Sareen, 2006; Afifi et al., 2011; Dunn, McLaughlin, Slopen, Rosand, & Smoller, 2013; King et al., 2011; MacMillan, Tanaka, Duku, Vaillancourt, & Boyle, 2013; Miranda et al., 2013a; Sperry & Widom, 2013; Sroufe et al., 2005).

A maternal childhood maltreatment history may increase risk for non-abusive yet poor caregiving by providing inadequate opportunities to observe healthy parenting behaviors and by compromising emotion regulation abilities, impairing a mother's capacity to respond sensitively to her child's needs (Cicchetti & Lynch, 1993; Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008; DiLillo & Damashek, 2003; Dixon, Browne, & Hamilton-Giachritsis, 2009; Egeland et al., 2002; Lyons-Ruth & Block, 1996; Maughan & Cicchetti, 2002; Shackman & Pollak, 2014). Studies have demonstrated associations between a maternal childhood maltreatment history and insensitive caregiving behaviors, including hostility, harsh discipline, intrusiveness, inconsistency, decreased involvement, and rejection (Bailey, DeOliveira, Wolfe, Evans, & Hartwick, 2012; Banyard, 1997; Collishaw et al., 2007; Lyons-Ruth & Block, 1996; Miranda et al., 2013b; Moehler, Biringen, & Poustka, 2007; Pereira et al., 2012; Rijlaarsdam et al., 2014). Exposure to such caregiving behaviors increases mental health risk across childhood (Sroufe et al., 2005). A few studies suggest that impaired maternal caregiving partially mediates associations between maternal childhood maltreatment history and offspring mental health (e.g., Collishaw et al., 2007; Rijlaarsdam et al., 2014), although others have failed to find such evidence (Miranda et al., 2013b).

A history of childhood maltreatment also predicts a range of developmental sequelae that increase maternal and child exposures to stress. For example, a maltreatment history is associated with school dropout and greater likelihood of being unemployed and living in poverty in adulthood (Noll et al., 2009; Zielinski, 2009). Low-income women are at elevated risk for exposure to chronic and severe negative life events (Hien & Bukszpan, 1999; Holman, Silver, & Waitzkin, 2000). Maternal exposure to stress may influence the caregiving context by negatively impacting maternal mental health and psychological functioning, increasing risk for child maltreatment, disrupting caregiving quality, and directly exposing the child to adversity (Miranda et al., 2013a; Rijlaarsdam et al., 2014). Very limited data suggest that children of maltreated mothers experience greater psychosocial adversity and negative life events and that these exposures partially mediate associations between maternal history and child behavior problems (Collishaw et al., 2007; Miranda et al., 2013b).

Finally, families of maltreated mothers may have reduced access to social support, as a maltreatment history predicts social isolation, intimate relationship dysfunction, and other indicators of low social support in adulthood (Berlin et al., 2011; Colman & Widom, 2004; Friesen, Woodward, Horwood, & Fergusson, 2010; Sperry & Widom, 2013). Low familial social support may undermine child mental health by limiting access to emotional, instrumental, and material resources and cognitive and social stimulation that may mitigate the effects of stress exposures, poor caregiving, and other negative environmental influences (Goodman & Gotlib, 1999; Min, Singer, Minnes, Kim, & Short, 2013; Scheeringa & Zeanah, 2001; Yates, Obradovi, & Egeland, 2010). Increased social support may alleviate maternal stress and psychopathology and, consequently, enhance caregiving quality (Min et al., 2013). Although some suggest that social support mediates associations between maternal childhood maltreatment history and child mental health, there is a paucity of research testing these relations (Min et al., 2013).

Importantly, various lines of research suggest that the impact of a maternal childhood maltreatment history on the caregiving context may vary across development, highlighting the need to consider child developmental status when studying intergenerational effects of maternal maltreatment history. For example, maternal history may have different effects on microsystem risk factors as the child ages and caregiving demands change. For some maltreated mothers, the acute distress and helplessness that infants and toddlers display may serve as traumatic reminders, increasing risk for insensitive caregiving and child maltreatment (Bosquet Enlow, Egeland, Carlson, Blood, & Wright, 2014; Liotti, 2004). Negative patterns of caregiving established during this period may become entrenched, influencing the quality of mother-child interactions into later childhood (Sroufe et al., 2005). For other maltreated mothers, the risk for poor caregiving and child maltreatment may increase during the preschool period, as the child struggles for autonomy, tests boundaries, and engages in frequent and intense emotional outbursts (Sroufe et al., 2005). Maltreated mothers may respond inappropriately due to their own compromised self-regulation abilities (Dvir, Ford, Hill, & Frazier, 2014). Additionally, very limited data suggest that children of maltreated mothers experience continuity as well as increases in exosystem risk factors across developmental periods. For example, Collishaw et al. (2007) found that children of maltreated mothers were not only exposed to a broad array of stressful life experiences across early childhood but to an increasing number of different exposures between ages 4 and 7 years (Collishaw et al., 2007).

The objectives of the current study were to (a) determine whether a maternal childhood maltreatment history is associated with increased child mental health problems; (b) ascertain whether a maternal childhood maltreatment history is associated with caregiving context risk factors at the level of the microsystem (child maltreatment, maternal caregiving quality) and exosystem (stress exposures, social support); (c) examine whether a maternal childhood maltreatment history has differential effects on the caregiving context during developmental periods that may present unique challenges: infancy/toddlerhood (0-24 months) and the preschool period (25-64 months); and (d) test whether caregiving context risk factors account for associations between maternal childhood maltreatment history and child mental health.

We hypothesized the following:

1. Maternal childhood maltreatment history is associated with increased child emotional and behavioral symptoms at age 7 years.

2. Maternal childhood maltreatment history predicts increased risk for child maltreatment, poorer maternal caregiving quality, greater exposure to stressors, and diminished social support.

3. Maternal childhood maltreatment history has independent effects on caregiving context risk factors during infancy/toddlerhood and the preschool period over and above moderate stability in these factors across developmental periods.

4. Child maltreatment, maternal caregiving quality, stress exposures, and social support paths from the infancy/toddlerhood period through the preschool period each contribute to the association between maternal childhood maltreatment history and child symptoms.

Method

Participants

Participants ($N = 187$) were from a longitudinal prenatal cohort designed to prospectively examine adaptation in low-income families (Sroufe et al., 2005). Between 1975 and 1977, primiparous women were recruited during the third trimester of pregnancy from the Midwestern urban public health clinic or county hospital from which they were receiving prenatal care. Women were eligible for study participation if their income was below the official poverty line. At the child's birth, mothers were between 12 and 34 years old ($M = 20.5$ years, $SD = 3.7$); 63% were not married (single, separated, divorced, widowed); and 39% had not completed high school ($M = 11.8$ years of education, $SD = 1.8$). Mothers' racial/ethnic composition was 80% White, 13% Black, 5% Native American, 1% Asian, and 1% Hispanic. Children's racial/ethnic composition was 63% White, 19% multi-racial, 12% Black, 4% Native American, 1% Asian, and 1% Hispanic. The racial/ethnic distributions represent the population from which the participants were drawn. Among the children, 54% were male. Cohort participants were included in the current study if they provided data on maternal childhood maltreatment history.

To assess the representativeness of the current sample with the original sample, we compared the current participants with those not included in analyses. There were no significant differences between families who were ($n = 187$) and were not ($n = 80$) included in the current study on maternal age, education, marital status, or socioeconomic status (SES) at the child's birth or child sex or race/ethnicity, all ps > .25. Limited additional data are available on excluded families, as the large majority withdrew soon after the child's birth. We also conducted an analysis of missing data for the full sample ($N = 267$) to investigate whether missingness was related to the variables under investigation; none of the variables, including covariates, were related to missingness. Finally, we conducted an analysis to determine if any of the study variables were related to missingness in the current sample ($N = 187$); the only variable significantly related to missingness was the covariate sociodemographic risk at birth (described under Procedures and Measures, Covariates).

Procedures and Measures

Maternal childhood maltreatment history, child mental health, child maltreatment, maternal caregiving quality, stress exposures, social support, and sociodemographic characteristics were operationalized utilizing a variety of measures administered from pregnancy until the child was age 7 years. The university's institutional review board approved and monitored all procedures. Mothers provided written informed consent. For each assessment, mothers were provided modest monetary compensation commensurate with the specific assessment demands.

Maternal childhood maltreatment history (predictor)—Mothers were classified as having a positive or negative history of maltreatment in their own childhood on the basis of interviews when the study child was 48 or 54 months old. Mothers reported the quality of care they received as children, including their living conditions, feelings toward their parents, degree of emotional support, discipline methods, and exposure to neglect, physical abuse, and/or sexual abuse. The maltreated group consisted of women who reported clear incidents of neglect or physical or sexual abuse (e.g., left outside in winter; burned with an iron) or corporal punishment that resulted in injury (e.g., broken bones). Inter-rater agreement on maternal childhood maltreatment history, calculated on 30 randomly selected interviews rated by two independent trained coders with experience working in the county child protection agency, was 97%.

Child mental health (outcome)—Child mental health was assessed using the parent (CBCL; Achenbach & Edelbrock, 1983) and teacher (TRF; Achenbach & Edelbrock, 1986) report forms of the Child Behavior Checklist. Mothers completed the CBCL when the children were age 7 years. The children's teachers completed the TRF in the spring of 1st grade (approximately age 7 years). Both forms provide ratings, standardized for age and gender, of internalizing, externalizing, and total emotional and behavioral symptoms. Both forms show high one-week test-retest reliabilities (.93 and .86 for CBCL and TRF total scores, respectively) and good convergent and criterion-related validities (Achenbach & Edelbrock, 1983, 1986). Maternal and teacher Total Behavior Problems T scores ($r = .35$, $p < .001$) were averaged to calculate a continuous rating of child emotional and behavioral problems as a measure of child mental health. In addition, a dichotomous (0/1) score was derived by coding children "1" if they received a maternal- and/or teacher-reported Total Behavior Problems T score > 63, which corresponds to the 90th percentile and is considered clinically significant. Clinically significant Total Behavior Problems scores show high correspondence with the presence of psychiatric diagnoses (Kasius, Ferdinand, van den Berg, & Verhulst, 1997). The magnitude of the correlation between the Internalizing and Externalizing Behavior Problems scale scores ($r = .61$, $p < .001$) suggests that the use of a total problem score did not result in undue aggregation of divergent information (Burt et al., 2005).

Child maltreatment (mediator)—Child exposure to maltreatment between 0-24 months and 25-64 months was identified prospectively from home observations at 7–10 days and at 3, 6, 9, and 12 months; videotaped laboratory observations at 9, 12, 18, 24, and 42 months; repeated structured maternal interviews throughout assessment periods; and reviews of

medical and child protection records at 24 and 64 months. Involvement with child protection services was checked for all participants. Children were classified as maltreated if there was evidence of any of the following: (a) physical abuse, defined as acts resulting in physical damage (e.g., bruises, cuts, burns); (b) emotional maltreatment, defined as emotional abuse (e.g., constant harassment or fault finding, harsh criticism) or emotional neglect (e.g., interacting only as necessary, emotional unresponsiveness); (c) physical neglect, defined as incompetent and irresponsible management of the child's daily care, inadequate nutritional or health care, or dangerous home environment due to insufficient supervision. From 25-64 months, children were also classified as maltreated if there was evidence of sexual abuse, defined as genital contact between the child and a person   5 years older (all perpetrators were adolescents or adults). Study staff classified participants as maltreated (scored "1") or not maltreated (scored "0") during each developmental period. Participants were classified as maltreated if there was a validated report with the County Child Protective Services (CPS), the mother reported maltreatment, and/or observational data met coding criteria consistent with state maltreatment statutes. At least three raters classified each participant, reaching near perfect agreement; disagreements were discussed until consensus was reached. Study staff reported suspected maltreatment to CPS, as required by law. All families in which physical and/or sexual abuse and/or neglect was classified were under the care of CPS and/or a public health nurse, supporting the scoring procedures; emotional maltreatment was identified only for cases that were consistently severe (Egeland, Sroufe, & Erikson, 1983; Shaffer, Yates, & Egeland, 2009). Validation for the identification of child maltreatment in this cohort has been reported previously (Shaffer, Huston, & Egeland, 2008; Shaffer et al., 2009).

Maternal caregiving quality (mediator)—Videotaped laboratory-based dyadic tasks designed to assess caregiver behaviors were administered at 24 and 42 months. The tool-use task at 24 months involved four problems of increasing complexity for the child to solve (e.g., use a weighted block to activate a lever system to obtain a treat; for full task description, see Matas, Arend, & Sroufe, 1978). Mothers were asked to offer any help they felt the child needed to complete the task. During the 42-month teaching task, mothers were asked to assist their child in completing four tasks too difficult for the child to complete on his/her own (e.g., solve a maze on an Etch-a-Sketch™; for full task description, see Erickson, Sroufe, & Egeland, 1985).

At each age, two scales scored by independent coders were used to develop a maternal caregiving quality rating. The supportive presence scale assessed the level of emotional and physical support the mother provided to help the child have a positive experience while encouraging autonomous work. The hostility scale assessed the mother's expressions of anger toward and discounting and rejection of the child. These scales were chosen given both constructs' documented links to maternal childhood maltreatment history and to child mental health (Bailey, et al., 2012; Gunnar & Quevedo, 2007; Lyons-Ruth & Block, 1996; Moehler et al., 2007; Pereira et al., 2012; Sroufe et al., 2005). Inter-rater reliability was high (supportive presence ICCs = .85 and .87 and hostility ICCs = .75 and .85 at 24 and 42 months, respectively), and the scales' validities have been demonstrated (Matas et al., 1978; Sroufe et al., 2005). The scales were moderately correlated at each age: $r = -.51$, $p < .001$ at

24 months, and $r = -.65$, $p < .001$ at 42 months. A maternal caregiving quality score was calculated at each age by adding the standardized z-scores from the supportive presence and hostility (reverse-scored) scales; lower scores indicate poorer caregiving quality.

Stress exposures (mediator)—At 18 and 42 months, mothers completed the Life Events Scale (LES; Egeland, Breitenbucher, & Rosenberg, 1980), a semi-structured interview assessing the occurrence and severity during the prior 12 months of more than 40 negative life events covering numerous areas (e.g., loss/death, health, finances, parent-child separation). The interviewer elicited details about endorsed events to enable later coding for severity, which was rated by trained staff on a 4-point scale that considered the frequency and degree of disruption caused by each event. The mean inter-rater agreement across all items was .86. At each time point, a total negative life events score was calculated by summing the number of items endorsed, weighted for severity, with higher scores indicating greater stress exposure.

Social support (mediator)—A social support scale assessed the extent and quality of the mother's support network (e.g., satisfaction with friendships, consistency and quality of available help). When relevant, the supportive quality of the mother's relationships with a romantic partner, family, friends, and outside agencies (e.g., religious institutions, psychotherapy) was considered. Trained raters scored maternal responses from structured interviews administered at 12, 18, 24, 30, 42, 48, 54, and 64 months using a 7-point scale reflecting the extent to which the mother felt her social network supported her emotional needs, ranging from almost total absence of support to a highly consistent and available support network. Inter-rater agreement within one point on 25% of cases, randomly selected, was 84–92% across time points. Social support scores were calculated for 0-24 months and for 25-64 months from the mean of available scores within each timeframe, with higher scores indicating greater access to social support.

Covariates—Covariates included child sex, child race/ethnicity (White or racial/ethnic minority), and sociodemographic risk at birth. Sociodemographic risk was calculated using variables with documented links to a maternal childhood maltreatment history and to poor child mental health, with one point assigned for each of the following: mother unmarried; adolescent mother (i.e., 19 years); SES in the lowest quartile of the sample. SES was calculated from at least two of three sources: the revised Duncan Socioeconomic Index household score (Duncan, 1961; Stevens & Featherman, 1981), mother's level of education, and household income, a recommended strategy for assessing SES (Oakes, 2012).

Data Analytic Plan

Data analyses proceeded in several steps. First, using t-test and chi-square analyses, we tested associations between maternal childhood maltreatment history and child emotional and behavioral problems (Hypothesis 1) and between maternal history and the caregiving context variables during the infancy/toddlerhood (0-24 months) and preschool (25-64 months) periods (Hypothesis 2). Caregiving context variables that did not show an association during either developmental period with maternal history were not considered further in analyses. We then tested path analysis models examining whether maternal

childhood maltreatment history predicted the caregiving context variables during each developmental period (Hypothesis 3) and whether the caregiving context variables from infancy/toddlerhood through the preschool period accounted for associations between maternal childhood maltreatment history and child mental health (Hypothesis 4). All path analysis models included all covariates (child sex, child race/ethnicity, sociodemographic risk at birth) and controlled for all within-time cross-domain correlations, cross-lag cross-domain paths, and within-domain stability paths for the caregiving context variables. For all path analysis models, the continuous Total Behavior Problems score was used as the outcome measure of child mental health.

We used a series of nested path analytic models and successive nested model comparisons, entering pathways in order of their expected magnitude of direct impact on the child's mental health, first including the microsystem variables and then the exosystem variables. Each model built upon the previous model by adding one additional path and was then tested to determine if the path addition improved model fit. A WLSMV (weighted least squares mean- and variance-adjusted chi-square test statistic) estimator with theta parameterization was employed. The DIFFTEST option in Mplus was used to obtain a corrected chi-square difference test for each of the model comparisons. After determining the best fitting model, tests for indirect effects were performed in Mplus.

Supplemental analyses tested two additional models. The first model ("Additional Controls Model") added covariates to the best fitting model determined in the path analysis to control for (a) out-of-home placement, operationalized as whether the child had lived outside the mother's care for at least 6 months during the study period ($n = 7$), to control for diminished exposure to the caregiving context variables; (b) caregiving context variables (stress exposures and social support) at 7 years, concurrent with the child mental health outcome; and (c) earlier child symptoms, assessed via maternal Total Behavior Problems T scores from the CBCL administered at 64 months. The second model ("Mediational Model") tested whether each caregiving context variable, composited across the two time points, mediated the association between maternal childhood maltreatment history and child symptoms. In the Mediational Model, all covariates, including the additional controls described above, were included.

For all analyses, $p < .05$ was considered statistically significant, and $p < .10$ was considered marginally significant.

Results

Descriptive Statistics and Associations among Study Variables

Twenty-seven percent of mothers were maltreated in childhood. Compared to children of non-maltreated mothers, children of maltreated mothers demonstrated greater emotional and behavioral problems, $t(178) = 4.27$ $p < .001$, and were more likely to score in the clinically significant range on the Total Behavior Problems score, $\chi^2(1,180) = 15.26$, $p < .001$. Maternal maltreatment history was significantly associated with child maltreatment, stress exposures, and social support during both the infancy/toddlerhood and preschool periods (Tables 1 and 2). Maternal maltreatment history was not associated with maternal caregiving

quality at 24 or 42 months, ps > .20 (Table 1); therefore, maternal caregiving quality was not considered further.

In the total sample, 30% of children experienced maltreatment between 0–64 months, with the following rates of non-mutually exclusive subtypes: 17% physical abuse, 18% emotional maltreatment, 15% physical neglect, 6% sexual abuse. Among children of maltreated mothers, 7% were maltreated from 0-24 months only, 13% from 25-64 months only, and 33% during both periods. Among children of non-maltreated mothers, 5% were maltreated from 0-24 months only, 10% from 25-64 months only, and 10% during both periods.[1]

In polychoric correlations, child emotional and behavioral problems were significantly associated with child maltreatment, stress exposures, and social support during both developmental periods (Table 2). Among the caregiving context variables, within-domain across-time correlations were moderate to strong, and cross-domain associations within and across time were modestly to moderately correlated (Table 2).

Path Model Analysis

Four nested path analysis models were tested (Figure 1a–d) using Mplus 7.2 (Muthén & Muthén, 1998–2013). Model 1 (Figure 1a) tested paths leading from maternal childhood maltreatment history through child maltreatment from 0-24 months and 25-64 months to child symptoms. Model 2 (Figure 1b) added a pathway leading from maternal history through stress exposures at 18 months and 42 months to child symptoms. Model 3 (Figure 1c) added a pathway leading from maternal history through social support from 0-24 months and 25-64 months to child symptoms. Model 4 (Figure 1d) added a direct path from maternal history to child symptoms to examine whether a direct effect was evident once the caregiving context pathways were included.

Amount of missing data in the path analyses was low, ranging from 0% to 8.6%, with a mean of 2.5% over all variables and time points. Data were determined to be missing at random given the following: (a) the low rate of missing data; (b) no data from the full sample ($N = 267$) were associated with missingness; and (c) only sociodemographic risk at birth, a control variable, was associated with missingness in the current sample ($N = 187$; Shafer & Graham, 2002). To allow analysis of all available data, maximum likelihood estimation was employed. Using the observed information matrix and allowing missingness to be a function of the observed covariates in weighted least squares estimation, Mplus computes robust standardized errors for the parameter estimates.

Based on fit statistics and chi-square difference testing (Table 3), Model 2 was a significantly better fit than Model 1, and Model 3 was a significantly better fit than Model 2. Model 4 was not a significantly better fit than Model 3, suggesting that the pathways in Model 3 accounted for maternal history effects on child symptoms. Thus, Model 3 was determined to be the most plausible model. Model 3 displayed an acceptable fit to the data

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[1]These percentages differ slightly from those in Table 1, with the former computed only for participants with data at both 0-24 months and 25-64 months and the latter for participants with data during either timeframe.

(Table 3) and accounted for 28.9% of the variance in child emotional and behavioral problems (Figure 2).

Table 4 presents the parameter estimates for significant and non-significant direct effects and for hypothesis-relevant significant indirect effects for Model 3. Maternal childhood maltreatment history had significant direct effects on child maltreatment from 0-24 months, social support from 0-24 and 25-64 months, and stress exposures at 18 and 42 months. Child maltreatment from 25-64 months and social support from 25-64 months each had significant direct effects and stress exposures at 42 months marginal effects on child emotional and behavioral symptoms at age 7 years. Child maltreatment, social support, and stress exposures demonstrated moderate to high within-domain stability across time (Figure 2).

The total indirect effects from maternal childhood maltreatment history to child emotional and behavioral problems were significant (Table 4). In addition, specific indirect effects were significant for the pathway from maternal history through child maltreatment from 0-24 months and child maltreatment from 25-64 months to child symptoms (Table 4). The specific indirect effects for the pathway involving social support and the pathway involving stress exposures were not significant, $ps > .14$.

Supplemental Analyses

In the Additional Controls Model, Model 3 was tested with the additional controls described above. The significant direct effects from maternal history to each of the caregiving context variables during infancy/toddlerhood were retained ($\beta = .32$, $p < .001$, $\beta = -.21$, $p < .001$, and $\beta = .21$, $p < .001$ for child maltreatment, social support, and stress exposures, respectively), as were the significant direct effects from maternal history to social support ($\beta = -.18$, $p = .011$) and stress exposures ($\beta = .22$, $p = .002$) during the preschool period. Also retained was the direct effect from child maltreatment from 25-64 months to child symptoms at 7 years, $\beta = .23$, $p = .046$. The direct effect from social support from 25-64 months to child symptoms was reduced from significant to marginal, $\beta = -.16$, $p = .068$, and the direct effect from stress exposures at 42 months to child symptoms from marginal to nonsignificant, $\beta = .09$, $p = .236$. The total indirect effects from maternal history to child symptoms remained significant, $\beta = .14$, $p < .001$. The specific indirect effects for the pathway from maternal history through child maltreatment at both time points to child symptoms was reduced from significant to marginal, $\beta = .06$, $p = .086$. This model accounted for 36.7% of the variance in child emotional and behavioral problems.

In the Mediational Model, the total indirect effects from maternal maltreatment history to child symptoms were significant, $\beta = .16$, $p < .001$, as was the specific indirect pathway from maternal history through child maltreatment to child symptoms, $\beta = .10$, $p = .023$. The stress exposure and social support pathways did not reach significance, $\beta = .03$, $p = .171$ and $\beta = .03$, $p = .255$, respectively.

Discussion

Little is known about the effects of a parental history of childhood maltreatment on child mental health. The objectives of this study were to (a) examine associations between a

maternal childhood maltreatment history and child emotional and behavioral problems in a sociodemographically at-risk sample of mothers and children assessed prospectively from pregnancy to age 7 years; (b) investigate whether maternal maltreatment history is associated with the caregiving context at the microsystem level (child maltreatment, maternal caregiving quality) and exosystem level (stress exposures, social support); (c) explore whether maternal maltreatment history has differential effects on caregiving context variables during different developmental stages of the child (infancy/toddlerhood and preschool); and (d) test the roles of caregiving context variables in the relationship between maternal maltreatment history and child mental health.

The results suggested that, by age 7 years, children of maltreated mothers showed greater emotional and behavioral problems, including elevated risk for clinically significant levels of symptoms. Further, a maternal maltreatment history predicted increased risk for child maltreatment, greater stress exposures, and lower social support across early childhood. Moreover, findings suggested that child maltreatment mediated the association between maternal maltreatment history and child symptoms. Notably, the findings are not attributable to single or adolescent parenthood or low SES, risk factors documented to be elevated among women maltreated as children and to predict poor child mental health (Friesen et al., 2010; McLoyd, 1998; Noll et al., 2009; Roberts et al., 2004; Zielinski, 2009), as these variables were included as controls in analyses.

A few additional findings are noteworthy. First, a maternal childhood maltreatment history was associated with increased risk for child maltreatment but, contrary to expectation, not with poorer caregiving quality. Although a number of studies have linked maternal maltreatment history to various indices of poor caregiving, many relied on maternal self-report of their childhood maltreatment history and their caregiving behaviors (e.g., Collishaw et al., 2007; Rijlaarsdam et al., 2014). Such studies risk inflated associations due to shared source variance. Associations may be diminished when single observations are utilized to assess caregiving quality, as done in this study. Also, the few studies that found mediational effects of maternal caregiving quality (Collishaw et al., 2007; Rijlaarsdam et al., 2014) did not account for child maltreatment and focused on caregiving behaviors that may be considered abusive (e.g., harsh discipline). Thus, the hypothesis that caregiving quality mediates maternal childhood maltreatment history effects on child mental health currently has limited support and is in need of further study. Second, maternal maltreatment history was associated with stress exposures and social support during both developmental periods even after accounting for the association between maternal history and child maltreatment. These results suggest that mothers able to "break the intergenerational cycle of maltreatment" (Egeland et al., 2002) may still be at risk for creating a negative caregiving context through increased stress exposures and reduced social support, part of the developmental sequelae of their maltreatment histories. Third, with rare exception, the literature has not addressed how maternal maltreatment history may differentially influence child risk over time. The current findings suggest that a maternal childhood maltreatment history is a risk factor for child maltreatment that begins in the first two years of life and extends through the preschool period. Further, maternal maltreatment history independently predicted increased stress exposures and diminished social support during both the infancy/ toddlerhood and preschool periods. These findings are significant given that higher levels of

adversity and lower levels of social support across developmental periods in early life increase risk for poor mental health outcomes (Briere, Kaltman, & Green, 2008; Cloitre et al., 2009; Collishaw et al., 2007).

Developmental psychopathology theory offers a framework for considering why the examined pathways may increase child mental health risk. Numerous strands of research indicate that exposure to negative environmental influences such as child maltreatment leads to (a) permanent disruptions in stress regulation abilities via functioning of physiological systems involved in stress reactivity (e.g., hypothalamic-pituitary-adrenal axis, autonomic nervous system); (b) changes to the structure and functioning of brain areas involved in mental health (e.g., amygdala, prefrontal cortex); (c) impaired cognition and emotional and behavioral regulation abilities; and (d) diminished capacities to develop healthy relationships with peers and adults (Cloitre et al., 2008; Dvir et al,. 2014; Enlow, Egeland, Blood, Wright, & Wright, 2012; Gunnar & Quevedo, 2007; Kim & Cicchetti, 2010; Lyons-Ruth & Block, 1996; Maughan & Cicchetti, 2002; McCrory, De Brito, & Viding, 2010; Shackman & Pollak, 2014; Sroufe et al., 2005). These effects are particularly robust when exposures occur in early life (Andersen et al., 2008; Appleyard, Egeland, Dulmen, & Sroufe, 2005; Bosquet Enlow et al., 2009; De Bellis, 2001; Dunn et al., 2013; Essex et al., 2011; Kessler, Davis, & Kendler, 1997; Pechtel & Pizzagalli, 2011; Pesonen & Raikkonen, 2012). Over time, this combination of physiological and neurocognitive vulnerabilities, diminished abilities to self-regulate, continued exposure to maltreatment and other stressors, and limited access to mitigating social supports leaves children of maltreated mothers vulnerable to experiencing a trajectory toward poor mental health.

Strengths, Limitations, and Future Directions

This is one of the only prospective studies to utilize longitudinal path analyses to examine the roles of multiple risk factors in the relationship between maternal childhood maltreatment history and child mental health. The design is unique in its focus on risk processes operating in early childhood and its incorporation of developmental considerations, allowing for an analysis of the impact of maternal maltreatment history on risk factors during different developmental periods. This study further extends the literature by examining associations among maternal maltreatment history, child mental health, and the caregiving context at multiple levels (microsystem, exosystem). By including these variables in one model, we were able to test how the different caregiving context variables were independently associated with maternal maltreatment history and with child mental health.

The multi-method, multi-informant, prospective longitudinal design is an additional strength of the study. Because of its prospective design, the only variable that relied on recall was maternal childhood maltreatment history, which was scored very conservatively, such that mothers were classified as maltreated only if they offered clear supporting evidence. Some mothers classified as not maltreated did not describe their parents as loving, supportive, or emotionally available. Thus, the analyses represent a relatively stringent test of the impact of a maternal maltreatment history, not just poor parenting, on the proposed pathways. The remaining variables were scored from data gathered prospectively from a variety of sources

(e.g., child protection records, standardized observations, teacher report), unlike many studies in this area, which have relied on maternal report for many or all constructs, often all collected during the same study contact. Additionally, participants were drawn from the community rather than from mental health clinics or via child protection records, broadening the generalizability of the findings.

Limitations include reliance on maternal report for determining maternal childhood maltreatment history, introducing possible error due to memory inaccuracies or reporting biases. Mothers were interviewed about their history when their child was 4 years old; mothers' recollections of their own maltreatment may have been influenced by their experiences parenting their own child such that maltreating mothers might have been more likely to report a history of childhood maltreatment. We were not able to confirm maternal childhood maltreatment via child protection records; notably, research suggests that relying solely on validated reports may underestimate the true magnitude of maltreatment (Hussey et al., 2006). Moreover, while some studies raise concerns about the accuracy of self-report of childhood adverse experiences, inaccuracies appear to be in the direction of underestimating adverse experiences, which would lead to an underestimation of the magnitude of associations among the study variables (Brewin, Andrews, & Gotlib, 1993; Collishaw et al., 2007; Fergusson, Horwood, & Woodward, 2000; Hardt & Rutter, 2004; Miranda et al., 2013a). Some suggest that maternal perception of childhood trauma has greater impact than the objective operationalization of trauma in influencing child outcomes (Min et al., 2013). Nevertheless, as with the majority of studies in this area (e.g., Collishaw et al., 2007; Min et al., 2013; Miranda et al., 2013a, 2013b; Rijlaarsdam et al., 2014) reliance on maternal report for maternal childhood maltreatment history is a weakness of the study.

This study likely only included in the maltreated group mothers who experienced more severe and consistent forms of maltreatment due to stringent coding criteria. Limited data suggest that more severe maternal childhood maltreatment is associated with increased child risk for experiencing a range of adversities and more persistent mental health difficulties (Collishaw et al., 2007). Children identified in this study as maltreated may also have been more likely to have experienced more extreme or persistent abuse or neglect. Future analyses should consider how variability in the severity of maternal and child maltreatment influences the model. Analyses could not examine whether the type of maternal or child maltreatment influenced the findings (Bailey et al., 2012; Collishaw et al., 2007; Roberts et al., 2004), given the high co-occurrence of different forms of maltreatment, as commonly found by others (Dixon et al., 2009). Future studies may consider how maternal and child maltreatment type as well as other maltreatment characteristics (e.g., relationship of perpetrator to victim) influence the model (Min et al., 2013; Rijlaarsdam et al., 2014).

We did not have measures of child mental health and each of the caregiving context variables at each assessment wave to include in the model, limiting our ability to make interpretations about temporal precedence and causality. Supplemental analyses that controlled for such measures that were available (child emotional and behavioral symptoms at 64 months, stress exposures and social support at age 7 years) generally supported the overall pattern of results reported in the main analyses, albeit at diminished magnitude for some paths. We cannot completely rule out other interpretations of the results, for example

that child mental health prior to 64 months influenced the caregiving context. Also, the models were not designed to test windows of susceptibility, i.e., whether the effects of the caregiving context variables on child mental health differed by child age at exposure, as this was not an objective of the study. Thus, the analyses cannot address whether exposure to the risk factors in infancy/toddlerhood or the preschool period had independent or joint effects on child mental health at age 7 years.

Risk factors not included (e.g., maternal psychopathology, paternal childhood maltreatment history, paternal caregiving quality, genetics) may contribute to the proposed model and should be considered in future research (Miranda et al., 2013a, 2013b; Rijlaarsdam et al., 2014). Larger studies may explore whether different models predict different symptom types, as there is some evidence that maternal maltreatment history has differential impact on child risk for internalizing versus externalizing symptoms and that different risk factors mediate these associations (Miranda et al., 2013a, 2013b; Rijlaarsdam et al., 2014). Finally, the literature is inconsistent as to whether gender influences associations among maternal childhood maltreatment history, mediating risk factors, and child mental health (Min et al., 2013; Miranda et al., 2013a, 2013b); thus, the role of gender should be considered in future studies, particularly ones that consider internalizing and externalizing symptom profiles separately.

The current study only recruited low-income women. Research is needed to determine how SES may influence variable associations. For example, high SES among maltreated mothers may indicate resilience, given the link between childhood maltreatment history and low SES (Zielinski, 2009); thus, these mothers may be at lower risk for experiencing other negative sequelae of a childhood maltreatment history. Furthermore, data suggest that higher SES families experience lower rates of child maltreatment and exposure to extreme and chronic stressors and have greater access to social supports and other resources that buffer or mitigate the impact of risk exposures on child mental health (e.g., Holman et al., 2000; Hussey et al., 2006). Whether these associations exist among mothers maltreated as children is unknown. The current findings need to be replicated in a contemporary sample to confirm that any changes in maltreatment rates, sociodemographic trends, or social policies in recent decades do not alter the results. Analyses were limited to families in which the mother provided information on her maltreatment history at the 48- or 54-month assessment. The large majority of enrolled families not included in the current analyses withdrew after providing limited data. Although there were no sociodemographic differences at birth between families who did and did not participate, there may have been a selection bias that influenced the results (e.g., families with greater psychosocial risk more likely to withdraw). Because the analyses were correlational, conclusive statements regarding cause and effect among study variables cannot be made.

Conclusions

Children of maltreated mothers are at increased risk for emotional and behavioral problems by age 7 years, and this risk appears to be mediated by exposure to maltreatment in early childhood. Moreover, maltreated mothers experience increased stress and diminished social support, potentially negatively influencing the caregiving context. Efforts to prevent adverse

intergenerational effects of a maternal childhood maltreatment history should start in early life, before maladaptive pathways are established. Importantly, mental health difficulties that emerge in early childhood predict long-term psychopathology (Bosquet & Egeland, 2006; Lavigne et al., 1998). Notably, the results suggest that many of the maltreated mothers did not maltreat their children and provided good quality caregiving. Study of these resilient mothers may provide additional insights that can inform intervention strategies (Egeland et al., 1988, 2002). Supporting at-risk families during a child's early years by reducing the child's risk of maltreatment, minimizing stress exposures, and increasing social support may have positive long-term effects that reverberate throughout life and even throughout generations.

Acknowledgments

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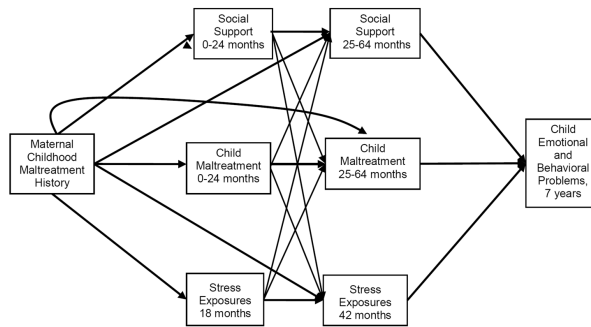
a. Model 1: Child Maltreatment Pathway Model
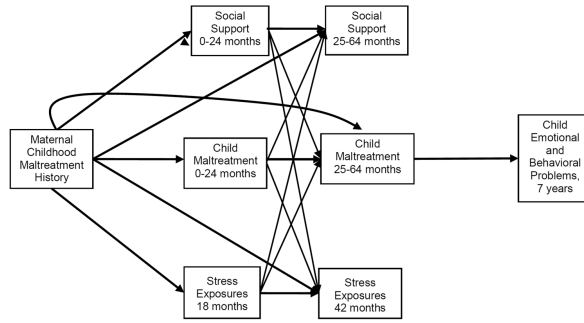
b. Model 2: Child Maltreatment + Stress Exposures Pathways Model
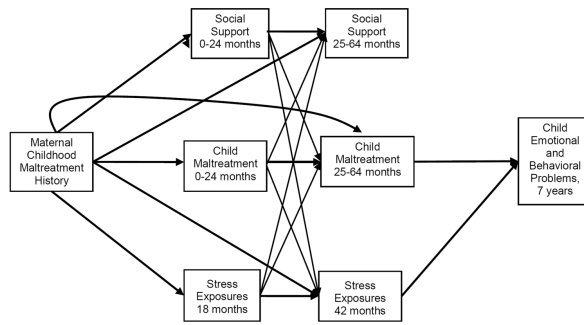
c. Model 3: Child Maltreatment + Stress Exposures + Social Support Pathways Model

d. Model 4: Direct Effects Model
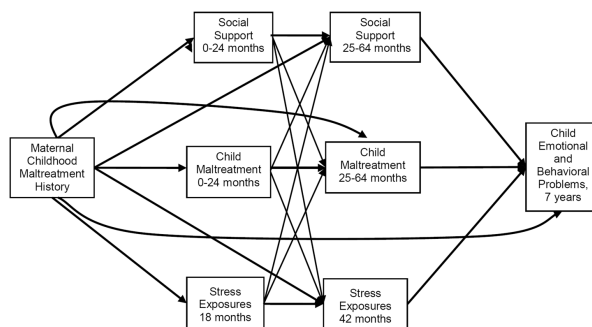
Figure 1.

The nested models tested. All models included child sex, child race/ethnicity, and sociodemographic risk at birth as controls on all paths as well as all within-time cross-construct correlations (not displayed for clarity purposes).

Figure 2.
Standardized path coefficients for tested paths of final model (Model 3). Only significant and marginal paths are displayed, with significant paths bolded.
+*p* < .10. *p < .05. **p < .01. ***p < .001.

Table 1

Study Variables for Total Sample and by Maternal Childhood Maltreatment History

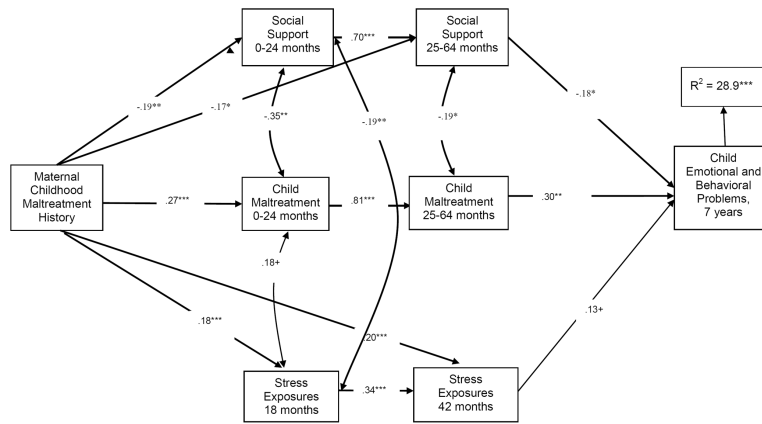| Variable	Maternal Childhood Maltreatment History										
	Total Sample (N = 187)				Not Maltreated (n = 136)			Maltreated (n = 51)			Effect Size [a]
	N	%	M	SD	%	M	SD	%	M	SD	
Total Problems Scale T score [b]	180		56.83	8.60		55.25	8.14		61.17	8.42	0.71
Total Problems Scale T score [b] > 63	180	27%			34%			67%			3.87 [1.92, 7.79]
Child maltreatment, 0–24 months	185	20%			13%			38%			3.98 [1.87, 8.49]
Child maltreatment, 25–64 months	172	27%			20%			46%			3.39 [1.64, 7.02]
Caregiving quality, 24 months [c]	160		−0.03	1.70		0.07	1.66		−0.29	1.79	0.21
Caregiving quality, 42 months [c]	179		0.00	1.83		0.11	1.79		−0.28	1.91	0.21
Stress exposures, 18 months [d]	171		0.02	1.03		−0.12	0.98		0.39	1.07	0.50
Stress exposures, 42 months [d]	181		0.01	1.02		−0.16	0.86		0.46	1.25	0.58
Social support, 0–24 months [d]	185		0.02	1.00		0.14	1.00		−0.33	0.93	0.49
Social support, 25–64 months [d]	186		−0.01	0.95		0.17	0.93		−0.48	0.82	0.74

Note. Categorical data are presented as percentages and continuous data as means and standard deviations. Participants were compared by maternal maltreatment status using chi-square analyses for categorical data and *t*-test analyses for continuous data. Bolded values are significantly different between maternal maltreatment history groups at $p < .05$, two-tailed.

[a] To represent effect sizes when comparing sample subgroups based on maternal maltreatment history, Cohen's d values were calculated for continuous dependent variables, and odds ratios were calculated for dichotomous dependent variables with the lower and upper limits for the 95% confidence interval in brackets.

[b] Scores based on average of maternal-report CBCL and teacher-report TRF Total Behavior Problems T scores.

[c] Scores are composite of two standardized *z*-scores. Higher scores indicate more supportive and less hostile caregiving.

[d] Scores are standardized *z*-scores.

Table 2

Polychoric Correlation Coefficients among Study Variables

	1	2	3	4	5	6	7	8	9	10
1. Child sex[a]	--									
2. Child race/ethnicity[b]	.07	--								
3. Sociodemographic risk at birth[c]	-.03	-.22***	--							
4. Maternal maltreatment history	-.07	-.02	.17*	--						
5. Child maltreatment 0–24 months	-.20**	-.25***	.36***	.34***	--					
6. Child maltreatment 25–64 months	.00	-.12	.37***	.31***	.80***	--				
7. Stress exposures 18 months	.12	.04	.26***	.22**	.26***	.20**	--			
8. Stress exposures 42 months	-.01	-.00	.16*	.27***	.16*	.23**	.38***	--		
9. Social support 0–24 months	.02	.21**	-.18*	-.21**	-.43***	-.34***	-.23**	-.14	--	
10. Social support 25–64 months	.03	.15*	-.16*	-.31***	-.38***	-.44***	-.18*	-.27***	.73***	--
11. Child Total Behavior Problems 7 years	-.10	-.11	.27***	.31***	.41***	.40***	.28***	.21**	-.31***	-.32***

[a]Male children were coded "0"; female children were coded "1."

[b]Racial/ethnic minority children were coded "0"; White, non-Hispanic children were coded "1."

[c]Sociodemographic risk at birth variable is a composite of maternal marital status, age (adolescent or adult), and SES.

*
$p < .05$.

**
$p < .01$.

***
$p < .001$.

Table 3

Comparison Statistics for Competing Nested Models

Model	df	χ^2	χ^2 Diff Test (df)	CFI	RMSEA	WRMR
Model 1: Child Maltreatment	6	19.638[**]		.964	.110	.357
Model 2: Child Maltreatment + Stress Exposures	5	16.408[**]	6.735 (1)[**] (2 vs. 1)	.970	.110	.325
Model 3: Child Maltreatment + Stress Exposures + Social Support	4	11.354[*]	9.200 (1)[**] (3 vs. 2)	.980	.099	.243
Model 4: Child Maltreatment + Stress Exposures + Social Support + Maternal Childhood Maltreatment History (Direct Effects Model)	3	8.792[*]	3.019 (1) (4 vs. 3)	.985	.102	.192

[*]
$p < .05$.

[**]
$p < .01$.

Table 4

Unstandardized and Standardized Parameter Estimates for Final Model, Model 3 (Standard Errors in Parentheses; N = 187)

Parameter Estimates	B (SE)	β
Child maltreatment, 0–24 months ON		
Maternal maltreatment history	.71 (.23)**	.27
Stress exposures, 18 months ON		
Maternal maltreatment history	.41 (.11)***	.18
Social support 0–24 months ON		
Maternal maltreatment history	−.42 (.17)*	−.19
Child maltreatment, 25–64 months ON		
Child maltreatment, 0–24 months	1.24 (.32)***	.81
Maternal maltreatment history	.31 (.34)	.08
Stress exposures, 18 months	−.07 (.19)	−.04
Social support, 0–24 months	−.01 (.15)	−.01
Stress exposures, 42 months ON		
Stress exposures, 18 months	.33 (.06)***	.34
Maternal maltreatment history	.46 (.15)**	.20
Child maltreatment, 0–24 months	−.02 (.11)	−.03
Social support, 0–24 months	−.03 (.08)	−.03
Social support, 25–64 months ON		
Social support, 0–24 months	.66 (.05)***	.70
Maternal maltreatment history	−.37 (.14)*	−.17
Child maltreatment, 0–24 months	−.04 (.09)	−.05
Stress exposures, 18 months	.02 (.04)	.03
Child Total Behavior Problems, 7 years ON		
Child maltreatment, 25–64 months	1.46 (.57)**	.30
Stress exposures, 42 months	1.09 (.65)+	.13
Social support, 25–64 months	−1.60 (.83)*	−.18

Significant Indirect Effects

Parameter Estimates	B (SE)	β
Total Indirect Effects		
Child Total Behavior Problems, 7 years IND	3.41 (.93) ***	.18
Maternal maltreatment history		
Specific Indirect Effects		
Child Total Behavior Problems, 7 years IND	1.28 (.65) *	.07
Maternal maltreatment history		
Child maltreatment, 0–24 months		
Child maltreatment, 25–64 months		

Note. Covariates included child sex, child race/ethnicity, and sociodemographic risk at birth.

+
p < .10.

*
p < .05.

**
p < .01.

***
p < .001.