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Mediating Links Between Maternal Childhood Trauma and Preadolescent Behavioral Adjustment

Meeyoung O. Min,[1] Lynn T. Singer,[2] Sonia Minnes,[1] Hyunsoo Kim,[1] and Elizabeth Short[3]

Abstract

Structural equation modeling was used to simultaneously examine maternal psychological distress and social support as mediators linking maternal childhood trauma (MCT) to both maternal and child-reported behavior at 9 years of age in 231 birth mother-child dyads, who were primarily poor, urban, and African American. One half of the mothers (*n* = 116) reported a history of childhood abuse and neglect. Although MCT was associated with both increased maternal psychological distress and limited social support at 6 years, the pathway to child behavior ratings at 9 years was informant dependent. MCT influenced maternal ratings of her child's behavior, with some effects mediated through psychological distress. MCT indirectly influenced children's self-perception of behavior through maternal experience of social support. Maternal ratings and child self-ratings of child behavior problems were moderately correlated.

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No significant gender interaction was found. Findings suggest a need for understanding trauma histories in the lives of mothers who seek assistance for parenting and child behavior problems, especially in urban low income communities. Interventions targeting both increasing maternal social support and reducing psychological distress may promote competency and resiliency among children for whom MCT poses a risk to optimal development.

Keywords

Maternal childhood abuse & neglect, child behavioral problems, maternal psychological distress, maternal social support, cross-informant

Childhood abuse and neglect continue to be prevalent. The Fourth National Incidence Study of Child Abuse and Neglect (Sedlak et al., 2010) estimated that more than 1.25 million children experienced maltreatment in 2005-2006. A recent community survey reported that about 30% of women had experienced at least one form of childhood maltreatment, with 13.7% having experienced more than one type (Scher, Forde, McQuaid, & Stein, 2004). The negative consequences of childhood abuse and neglect for maltreated individuals have been extensively documented, ranging from neurobiological changes (Nemeroff, 2004), emotional disturbance (Briere & Jordan, 2009), interpersonal difficulties (Cook et al., 2005) to psychiatric and substance abuse disorders (Kendler et al., 2000; Min, Farkas, Minnes, & Singer, 2007), all of which may interfere with optimal parenting. Accordingly, intergenerational effects of maternal childhood trauma (MCT) have been indicated with elevated risks for behavioral problems among offspring (Bifulco et al., 2002; Roberts, O'Connor, Dunn, Golding, & the ALSPAC Study Team, 2004; Thompson, 2007). However, relatively few studies have focused on the mechanisms through which maternal history of childhood trauma may affect child development, and there is limited understanding of the process linking MCT and child behavior (Noll, Trickett, Harris, & Putnam, 2009). Given the tenacious effects of MCT across generations, understanding the specific processes accounting for the link between MCT and child behavior could improve prevention efforts aimed at interrupting the intergenerational transmission of trauma.

Maternal Psychological Distress and Social Support as Mediating Links

The theory of intergenerational transmission of trauma posits that MCT and its impact are passed on to children through the children's direct exposure to

mother's distress and limited psychosocial functioning (Schwerdtfeger & Goff, 2007; Thompson, 2007), such as maternal psychological distress (e.g., Bifulco et al., 2002; Dubowitz et al., 2001) and lack of social support (e.g., Egeland, Jacobvitz & Sroufe, 1988; Runtz & Schallow, 1997). Maternal self-reported psychological distress has been associated with both MCT and with behavior problems in their children (Dubowitz et al., 2001). Distressed mothers tend to be less responsive and less emotionally available for their children, more likely to use coercive behaviors (Bifulco et al., 2002; Thompson, 2007), and often fail to appropriately monitor their children's behaviors, allowing elevated risk for a variety of behavioral difficulties (Loukas, Piejak, Bingham, Fizgerald, & Zucker, 2001).

Substantial research has also demonstrated childhood trauma as a predictor of problematic adult relationships (Cook et al., 2005) and poor social support (Runtz & Schallow, 1997), which may influence children's behavioral adjustment (Koverola et al., 2005). Social support, as experienced by the mother, alleviates parenting stress by increasing maternal resources and is associated with less restrictive, more nurturing parenting (Belsky, 1984). Social support facilitates mothers' abilities to remain engaged with their children, promotes child competence (Roberts & Stayer, 1987), and protects children from developing behavioral problems (Ghazarian & Roche, 2010; Herwig, Wirtz, & Bengel, 2004). Furthermore, maternal social networks may have a direct effect on the child by providing cognitive and social stimulation through the opportunity to observe and participate in diverse social relations and interactions (Cochran & Brassard, 1979; Homel, Burns, & Goodnow, 1987).

Empirical studies investigating the mediational role of maternal psychosocial functioning in the relationship between MCT and offspring behavior have produced inconsistent findings, in large part due to the methods employed, such as the type of informant used. Roberts et al. (2004), using a community-based representative sample in England, found that maternal anxiety partially mediated the effects of childhood sexual abuse on maternal ratings of their four-year olds' adjustment difficulties of conduct and peer problems. However, significant mediation of maternal psychological functioning on child behavior problems was not found when independent informant (teacher) ratings were employed (Morrel, Dubowitz, Kerr, & Black, 2003; Koverola et al., 2005). Similarly, Fitzgerald, Shipman, Jackson, McMahon, & Hanley (2005) reported that maternal childhood sexual abuse was not related to objective observations of parenting, despite mothers' feelings of lower self-efficacy as a parent. Thus, findings from prior studies might be confounded by biases associated with a single informant through shared method variance. Independent of MCT, numerous studies of child behavior outcomes based on mothers' reports have indicated maternal psychological distress as a correlate

of their perception of child behavior problems. By relying solely on maternal report for the predictor (MCT), mediator (maternal psychological functioning), and outcome (child behavior), prior findings were subjected to a risk of inflated associations between MCT and child behavior.

Drawing on the methodological limitations noted from the previous studies, the present study examines the relationship between MCT and child behavior problems using multiple informants. Maternal psychological distress and social support were simultaneously examined as mediators on both maternal assessment and child self-report of child behavior using structural equation modeling (SEM). To account for commonalities among the endogenous variables representing maternal psychological functioning and child behavior, correlations between maternal distress and social support and between mother report and child self-report were estimated in the model. We hypothesized that mothers with more severe childhood trauma would have higher levels of psychological distress and lower levels of social support and that these factors would increase child behavior problems. By using both maternal and youth report, we attempted to isolate shared method effects. Gender differences in the mediation process were also explored.

Method

Participants & Procedure

This study included 231 birth mother-child dyads, which were drawn from a cohort recruited at childbirth from a large, urban, county, teaching hospital that participated in a longitudinal prospective study on the effects of prenatal cocaine exposure (Singer et al., 2004). Pregnant women considered to be high risk for drug use due to lack of prenatal care, behavior suggesting intoxication, history of involvement with the Department of Human Services, or self-admitted drug use, were given drug toxicology screenings at infant birth. Women with a psychiatric history, low intellectual functioning, HIV-positive status, or chronic medical illness were excluded, as were infants with Down Syndrome, Fetal Alcohol Syndrome, or medical illness. A total of 404 birth mothers and their newborns were enrolled at birth. Of the 404 mothers, 11 had children who died by 4 years and no longer participated, and 302 mothers were assessed for childhood maltreatment at 4 years postpartum. Fifty-eight birth mother-child dyads were excluded because the birth mother lost child custody and was no longer the primary caregiver at 9 years postpartum, and 13 dyads were excluded due to incomplete data, resulting in the present study sample of 231. Urine, infant meconium analyses or self-report indicated

199 (86%) mothers used at least one substance during pregnancy: 95 (41%) used cocaine, 158 (68%) used cigarettes, 148 (64%) used alcohol, 63 (27%) marijuana, and 142 (61%) used two or more substances during pregnancy. Compared with the 173 mothers who were not included, the 231 participating mothers had higher education (11.6 years (*SD* = 1.5) vs. 11.9 (*SD* = 1.5), *p* = .04), were more likely to be married at child birth (8% vs. 15%, *p* = .02), and were less likely to smoke cigarettes (79% vs. 68%, *p* = .02) and were use cocaine (66% vs. 41%, *p* < .001) during pregnancy. No other sociodemographic and drug use differences were found.

Birth mothers and their child were seen at the developmental research laboratory for approximately 5 hours at each follow-up visit. Data in the present study were taken from interviews conducted when the children were 4 (MCT), 6 (maternal psychological distress and social support), and 9 years of age (child behavior). Maternal demographic characteristics such as age, race and education were taken from hospital birth records. All subjects were given a monetary stipend for participation, along with lunch and transportation costs. The Institutional Review Board of the participating hospital approved the study. Parental written informed consent, and child assent were obtained. A Certificate of Confidentiality (DA-98-91), exempting the study from legislative, judicial, or administrative attempts to obtain confidential information, was obtained from the Department of Health and Human Services.

Measures

Maternal recollection of childhood abuse and neglect was assessed using the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998; Bernstein et al., 2003), a 28-item self-report inventory assessing five types of trauma: emotional, physical and sexual abuse, and emotional and physical neglect. Items were rated on a 5-point scale according to their frequency (*1 = never true* to *5 = very often true*), and summed to yield a total score for each trauma, ranging from 5 to 25, with higher scores indicating greater severity. Scores >12 in emotional abuse, >9 in physical abuse and neglect, >7 in sexual abuse, and >14 in emotional neglect indicate moderate to severe levels of trauma (Bernstein & Fink, 1998).

Maternal psychological distress was assessed at the 6 year visit with the Brief Symptom Inventory (BSI; Derogatis, 1992), a widely used 53-item self-report standardized assessment of nine primary symptoms experienced in the past 7 days: somatic complaints, obsessive-compulsive behavior, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Items were rated on a 5-point scale (*0 = not at all*

to *4 = extremely*) with higher scores indicating greater distress. The BSI Global Severity Index (GSI), the average rating of all 53 items, was used. Scores > 90th percentile (*GSI score* ≥ .78) indicate the borderline/clinical range. The GSI was specified as the sole indicator of maternal psychological distress due to excellent psychometric properties; the factor loading of the GSI was fixed with its square root of α = .95 for SEM analyses.

Maternal social support was assessed at the 6 year visit with the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988), a 12-item scale measuring perceived support from family members, friends and a special person. Items are rated on a 7-point scale (*1 = very strongly disagree* to *7 = very strongly agree*) with higher scores indicating higher social support.

Child behavior was assessed at the 9 year visit using the Child Behavior Checklist for ages 6-18 (CBCL; Achenbach & Rescorla, 2001) and the Dominic Interactive (DI; Valla, 2000). The CBCL is a 112-item parent rating of the child's behavior, designed to assess emotional, behavioral, and social problems of children in the past 6 months. Items are coded from *0 (not true)* to *2 (very often or often true)* and written at the 5th grade reading level. Resultant *T*-scores were standardized for gender and age with higher scores indicating more problem behaviors. For this investigation, *T*-scores of internalizing (i.e., withdrawn, somatic complaints, and anxious/depressed), externalizing (i.e., aggression and delinquency) behaviors, and inattention were used. Given that factor analyses of the CBCL have consistently yielded a relative independence of inattention from both internalizing and externalizing behaviors (Achenbach & Rescorla, 2001), yet attention processes are implicated in most areas of psychological functioning (NICHD Early Child Care Research Network, 2003), inattention was included in the analyses to capture broader ranges of behavioral adjustment and problems.

The DI, a child's self-rating of his or her own behavior, is a standardized, computerized assessment of symptoms from seven Diagnostic and Statistical Manual of Mental Disorders (4th ed., DSM-IV) diagnostic categories (American Psychiatric Association, 1994) in children ages 6-11. Each question is presented with colorful pictures and a voiceover that reads the question aloud. The child responds *Yes* or *No* to 91 questions that ask whether the child engages in the behavior that the depicted character demonstrates. The psychometric characteristics of the DI for this sample were previously investigated (Linares, Short, Singer, Russ, & Minnes, 2006) with *α* in the moderate to excellent range (.63-.92). For this administration *α* = .89 on internalizing (specific phobias, separation anxiety disorder, generalized anxiety disorder, major depression or dysthymia), *α* = .86 on externalizing (oppositional

defiant disorder, conduct disorder) and $\alpha = .79$ on attention-deficit/hyperactivity disorder (ADHD).

Data Analysis

Data that were positively skewed were normalized using a log transformation prior to analyses. Means and standard deviations were reported by the variables' original distribution, with transformations used in analyses. Dichotomized variables (i.e., subscales of the CTQ & GSI) were used for descriptive purposes, whereas the continuous forms were used in analyses. Zero-order Pearson correlations were estimated to examine relationships between observed variables. Maternal education, age, and race were examined as potential covariates.

The hypothesized model was tested using SEM with maximum likelihood estimation in AMOS v17.0. The measurement model was tested using confirmatory factor analyses (CFA). Model fit between the hypothesized model and the observed data was examined using the χ^2 goodness-of-fit test, as well as the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) indices. Values $\geq .95$ for CFI and TLI, $\leq .06$ for RMSEA, and $\leq .08$ for SRMR indicate a good fit (Hu & Bentler, 1998). After an adequate measurement model was established, measurement invariance (Farrell, 1994) was examined across gender before proceeding to structural analyses. Invariance for factor loadings (weak invariance) and intercepts (strong invariance) was tested (Little, 1997). The weak invariance model was compared with an unconstrained model, and the strong invariance model was compared with the weak invariance model. Weak and strong invariance were deemed present if the change in CFI and RMSEA statistics was negligible ($\leq .01$; Cheung & Rensvold, 2002).

A structural model is tested on the basis of the CFA. A partial mediation model (i.e., both direct and indirect effects) was compared with a complete mediation model (i.e., indirect effects only) using the χ^2 difference ($\Delta\chi^2$) test (Kline, 1998). Mediation was tested by examining the joint significance of paths leading to and from the mediating variables (maternal psychological distress and social support in this study) as recommended by MacKinnon, Lockwood, Hoffman, West, & Sheets (2002), because the traditional method of testing mediation (Baron & Kenny, 1986) has been shown to increase Type II error. The significance of and confidence intervals (CI) for the mediated effect was tested using the PRODCLIN program (MacKinnon, Fritz, Williams, & Lockwood, 2007). Mediated effects are statistically significant when CI do

not contain zero. Gender moderation was explored using multiple-group analyses by comparing a structural model that allowed parameter estimates to differ by gender with a model that constrained parameter estimates to be identical for boys and girls. For ease of interpretation, parameter estimates are presented in standardized form. Power analysis (MacCallum, Browne, & Sugawara, 1996) indicated adequate power (> .90) for the present study given $\alpha = .05$, $df = 82$, and $N = 231$.

Results

Sample Characteristics

Participants were 231 mothers and their biological children (111 boys, 120 girls) who were primarily African American ($n = 188$, 81%) and of low socioeconomic status (SES; $n = 226$, 98%), measured by the Hollingshead classification IV and V (Hollingshead, 1957). The mean maternal age was 36.7 years ($SD = 5.48$, range = 28-50) at the 9 year follow-up. Only a quarter of mothers ($n = 59$) were married and half ($n = 113$) were employed; 36% of mothers ($n = 83$) had not finished high school, with a mean of 11.9 years of education ($SD = 1.52$, range = 8-19).

   Childhood trauma was prevalent among these mothers. About one-third (30%, $n = 70$) reported a history of sexual abuse; 27% ($n = 62$) physical abuse; 19% ($n = 44$) emotional abuse; 28% ($n = 64$) emotional neglect; and 26% ($n = 59$) physical neglect. About half ($n = 116$) reported at least one type of childhood abuse/neglect; 32% ($n = 75$) more than one type of abuse/ neglect; and 7% ($n = 17$) all five types of childhood abuse/neglect. About one-sixth of the mothers (16%, $n = 36$) scored above the borderline/clinical cut-point on the GSI at the 6 year postpartum assessment. Maternal and child self-ratings were modestly correlated ($p \leq .01$) for externalizing behavior ($r = .24$) and inattention ($r = .17$), but not for internalizing behavior ($r = .10$, $p > .05$). No significant ($p < .05$) gender difference was found on the mean scores of the observed outcome variables except child-reported internalizing behavior (boys' $M = 19.01$ ($SD = 10.03$), girls' $M = 21.87$ ($SD = 9.66$), $t = 2.19$, $p < .03$). Means and standard deviations, along with zero-order correlations and α, for observed variables are presented in Table 1. Sociodemographic variables (maternal education, age, and race) assessed were not significantly related to either the mediators (maternal psychological distress and social support) or outcome variables and thus were not included in SEM analyses.

Table 1. Means, Standard Deviations, Internal Reliability (α), and Correlations for Observed Variables ($N = 231$)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Maternal childhood trauma					Maternal social support			Maternal psychological distress	Maternal report (CBCL)			Child self-report (DI)		
Maternal childhood trauma															
1. Emotional abuse	—	.67	0.51	0.65	0.57	-0.36	-0.25	-0.26	0.26	0.19	0.22	0.11	0.02	0.11	0.02
2. Physical abuse		—	0.57	0.49	0.51	-0.28	-0.14	-0.15	0.13	0.14	0.17	0.05	0.05	0.04	0.01
3. Sexual abuse			—	0.35	0.41	-0.23	-0.16	-0.10	0.17	0.17	0.22	0.09	0.10	0.04	0.01
4. Emotional neglect				—	0.61	-0.45	-0.31	-0.31	0.19	0.08	0.17	0.07	0.03	0.10	0.06
5. Physical neglect					—	-0.36	-0.35	-0.26	0.13	0.003	0.02	0.01	0.003	0.03	0.03
Social support (6 year)															
6. Family						—	0.71	0.61	-0.29	-0.03	-0.15	-0.11	-0.14	-0.06	-0.15
7. Friends							—	0.66	-0.30	-0.03	-0.11	-0.04	-0.15	-0.05	-0.17
8. Special person								—	-0.26	-0.10	-0.10	-0.09	-0.07	-0.01	-0.13
Psychological distress (6 year)															
9. Psychological distress									—	0.30	0.23	0.16	0.01	-0.01	0.01
Maternal report (9 year)															
10. Internalizing										—	0.69	0.58	0.10	0.11	0.16
11. Externalizing											—	0.61	0.15	0.24	0.20
12. Inattention												—	0.17	0.16	0.17

(continued)

Table 1. (continued)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Child self-report (9 year)															
13. Internalizing													—	0.49	0.62
14. Externalizing														—	0.62
15. Inattention															—
M	9.10	8.54	8.39	11.31	8.11	21.14	20.23	23.46	0.39	48.40	50.52	55.56	20.52	3.91	6.63
SD	4.97	4.67	5.72	5.39	3.97	7.30	6.65	6.43	0.48	11.21	11.67	7.07	9.92	3.56	4.31
Median	7	7	5	11	6	24	21	26	0.23	48	50	53	20	3	6
α	0.85	0.84	0.94	0.85	0.70	0.95	0.94	0.96	0.95	0.88	0.93	0.87	0.89	0.86	0.79

Note: $p < .05$ when $r \geq .13$. $p < .01$ when $r \geq .17$.

Model Estimation

The measurement model, which included all possible associations among the factors, yielded an acceptable fit, χ^2 (81, $N = 231$) = 150.65, $p < .001$, CFI = .951, TLI = .927, RMSEA = .061 (90% *CI* = .046 –.072), SRMR = .051. Based on modification indices, the measurement errors of the two observed neglect variables were correlated, χ^2 (80, $N = 231$) = 137.79, $p < .001$, CFI = .959, TLI = .939, RMSEA = .056 (90% *CI* = .040 –.072), SRMR = .052. The measurement errors of emotional neglect and emotional abuse were also correlated, χ^2 (79, $N = 231$) = 128.64, $p < .001$, CFI = .965, TLI = .947, RMSEA = .052 (90% *CI* = .035 –.068), SRMR= .054. All factor loadings were strong, ranging from .63 to .89 (all *p*'s < .01). The measurement model was equivalent across gender, as indicated by CFI ranging from .973 (unconditional model) to .967 (weak invariance model) to .955 (strong invariance model) and RMSEA from .032 to .038. Greater MCT was related ($p < .05$) to increased maternal psychological distress ($r = .26$), decreased social support ($r = -.39$), and maternal report of increased child behavioral problems ($r = .23$), but not with child-reported behavioral problems ($r = .04$). Higher maternal psychological distress was also related to lower social support ($r = -.38$) and maternal report of greater child behavioral problems ($r = .32$), but not with child-reported behavioral problems ($r = .02$). Higher maternal social support was marginally related to fewer child-reported behavioral problems ($r = -.14$, $p = .07$) and fewer mother-reported behavioral problems ($r = -.13$, $p > .10$). Maternal ratings of child behavior and child self-rated behavioral problems were positively related ($r = .27$). This CFA model was accepted as our final measurement model.

Based on the results for the measurement model, the structural model was modified. That is, the three paths with nonsignificant ($p > .10$) correlation coefficients from the measurement model were deleted: (a) the path from MCT to child self-rated behavior; (b) the path from maternal psychological distress to child self-rated behavior; and (c) the path from maternal social support to maternal report of child behavior. This respecified SEM model showed that all path coefficients were significant at the .05 level, suggesting that the effects of MCT on maternal report of child behavior was partially mediated via maternal psychological distress, χ^2 (82, $N = 231$) = 129.30, $p = .001$, CFI = .967, TLI = .951, RMSEA = .050 (90% *CI* = .033-.066), SRMR= .056. The relative fit of a complete mediation model (i.e., no direct path from MCT to maternal ratings of child behavior) indicated a significant decrease in fit from the partial mediation model (i.e., model with a direct path from MCT to maternal ratings of child behavior), $\Delta\chi^2$ (1) = 4.09, $p = .04$. Thus, the
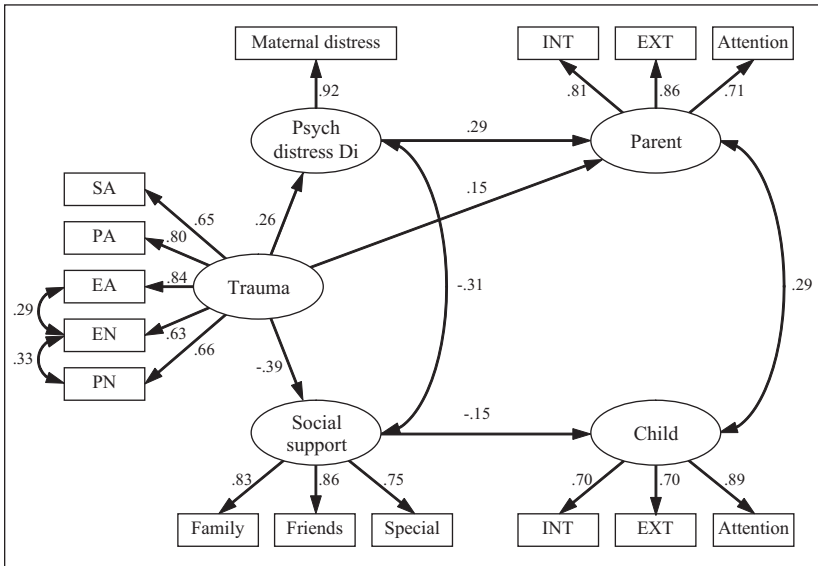
Figure 1. Structural equation model of the impact of maternal childhood trauma on child behavior at age 9 (*N* = 231). Rectangles indicate observed variables, and ovals represent latent constructs. All path coefficients (standardized) are significant at the .05 level. EA = emotional abuse; PA = physical abuse; SA = sexual abuse; EN = emotional neglect; PN = physical neglect.

partial mediation model of maternal psychological distress on maternal report of child behavior was selected as our final model (Figure 1)

Findings provided partial support for study hypotheses. MCT was associated with a decrease in perceived maternal social support at 6 years ($\beta = -.39$; $p < .001$), which was associated with an increase in child-reported behavioral problems at 9 years ($\beta = -.15$; $p = .05$). Mothers who perceived greater social support at 6 years postpartum had children who self-reported fewer behavioral problems 3 years later. Correlation analyses (Table 1) indicated that higher maternal social support was related primarily to improved internalizing and attention problems, but not to externalizing behavioral problems. Mediation analyses indicated a significant (95% *CI* = 0.01-1.15) mediated effect of maternal social support on child self-reported behavior. MCT was also associated with higher maternal psychological distress at 6 years ($\beta = .26$; $p < .001$), which was associated with maternal ratings of increased

Table 2. Model Comparisons ($N = 231$)

	$\chi^2(df)$	$\Delta\chi^2(\Delta df)^b$	CFI	TLI	RMSEA (90% CI)	SRMR
Measurement model						
Model 1. CFA model	150.65 (81)	—	.951	.927	.061 (.046-.072)	.051
Model 2. Model 1 with correlated measurement errors of physical neglect and emotional neglect	137.79 (80)	12.86 (1)***	.959	.939	.056 (.040-.072)	.052
Model 3. Model 2 with correlated measurement errors of emotional abuse and emotional neglect	128.64 (79)	9.15 (1)***	.965	.947	.052 (.035-.068)	.054
Structural model						
Model 4. Partial mediation model[a]	129.30 (82)	—	.967	.951	.050 (.033-.066)	.056
Model 5. Complete mediation model	133.39 (83)	4.09 (1)*	.964	.947	.052 (.035-.068)	.062
Multiple-group comparison						
Model 6. Model 4 without gender constrained	246.59 (189)	—	.959	.948	.036 (.022-.049)	.068
Model 7. Model 4 with gender constrained	253.07 (194)	6.48 (5)	.958	.948	.036 (.022-.048)	.072

Note: CFI = comparative fit index. TLI = Tucker-Lewis index. RMSEA = root mean square error of approximation. SRMR = standardized root mean squared residual.
[a]Nonsignificant ($p > .10$) paths from the final measurement model (Model 3) were deleted (The final model).
[b]$\Delta\chi^2$ (Δdf) was computed based on the chi-square difference from the previous model.
*$p < .05$. **$p < .01$. ***$p < .001$.

child behavioral problems ($\beta = .29$; $p < .001$). Mediation analyses indicated a significant (95% CI = 0.78-4.56) mediated effect of maternal psychological distress on maternal report of child behavior. MCT also had a direct effect on maternal ratings of behavioral problems ($\beta = .15$; $p = .045$). Greater maternal psychological distress was related to decreased social support ($r = -.31$); maternal ratings of behavioral problems and child self-report were also correlated ($r = .29$). No significant gender interaction was found as indicated by the gender specific model, χ^2 (189, $N = 231$) = 246.59, $p = .003$, CFI = .959, TLI = .948, RMSEA = .036 (90% $CI = .022$-.049), compared with the gender-constrained model χ^2 (194, $N = 231$) = 253.07, $p = .003$, CFI = .958, TLI = .948, RMSEA = .036 (90% $CI = .022$-.048); $\Delta\chi^2$ (5) = 6.48, $p = .26$. Table 2 summarizes fit indices for various models estimated.

Discussion

This study examined longitudinal, intergenerational association between MCT and children's preadolescent behavioral adjustment using maternal and child reports. Maternal psychological distress and social support were simultaneously examined as potential mediators linking MCT to child behavior at 9 years of age. Although MCT was associated with increased maternal psychological distress and limited social support, its pathway to child behavior problems differed between maternal perception and child self-report. When child behavior was assessed by the mother, the impact of MCT was partially mediated by maternal psychological distress; whereas when the child's behavior was assessed by child self-report, the impact of MCT was indirect through maternal social support. Thus, greater maternal psychological distress associated with MCT was a risk factor for maternal perceptions of child behavioral problems, whereas poorer maternal social support was a risk factor for child self-assessed behavioral problems. Despite the different times of assessment by different informants, the indirect effects of MCT via maternal social support on child-reported behavior appear substantial. Given the low cross-informant correlations found in this study as well as in other studies (Achenbach, MaConaughy, & Howell, 1987; Briggs-Gowan, Carter, & Schwab-Stone, 1996; De Los Reyes & Kazdin, 2005), our findings suggest different maternal correlates of child behavior specific to informant, which should be further explored and replicated in future studies.

Maternal social support is indicative of the social resources that the mother has access to in times of need. Maternal perceptions of available social support may attenuate parenting stress and allow mothers to be more emotionally responsive to and to remain engaged in the lives of their children (Ghazarian & Roche, 2010). Furthermore, children of mothers with greater social support may have access to a greater number of adults available for support and involvement in their lives, contributing to a more enriched establishment of the children's own social support network (McCarty, McMahon, & Conduct Problems Prevention Research Group, 2003), which may shield children from the negative impact of MCT. Thus, a lack of maternal social support is a marker of family risk and may explain the differences in children's behavior that are associated with MCT.

Our finding that maternal psychological distress was related to maternal ratings of child behavior problems and not child-reported behavioral problems could be interpreted in light of the sample characteristics. Our sample was drawn from an inner-city population in which multiple risk factors are prevalent and fewer protective factors are readily available. Maternal

psychological distress is likely to be one of a number of risk factors in our sample, and the relationship of maternal psychological distress to child self-rated behavior may have been obscured by the presence of other risk factors such as domestic violence and living in unsafe neighborhoods. Furthermore, maternal distress may color the perception of child behavioral problems and contribute to cross-informant discrepancies (Briggs-Gowan et al., 1996). Although maternal psychological distress seems a well-established empirical determinant of child behavior (e.g., Conger, Patternson, & Ge, 1995; Loukas et al., 2001), those findings seem more to pertain to early childhood. The impact of maternal psychological distress may be less salient during the child's preadolescence than at younger ages.

Although our study examined maternal distress and social support as correlates without specifying the nature of the relationship, social support may be a contributor to psychological distress (Salazar, Keller, & Courtney, 2011). Given the substantial correlation between the two mediators (Figure 1), future studies exploring relationships between maternal psychological distress and social support among mothers with a childhood trauma history will further clarify empirical understanding of the mechanisms linking MCT and child preadolescent adjustment.

Several limitations in our study should be noted. First, the validity of an adult retrospective self-report measure of childhood trauma may be compromised by fallibility of memory and/or social desirability bias. Furthermore, lack of explicit details of the trauma (duration, age at which abuse first occurred, relationship to perpetrator) may not fully characterize the experience of MCT and its effect on offspring. Nevertheless, the perception of the childhood trauma experienced and the way in which the childhood trauma has affected psychosocial functioning in adulthood may matter more than the objective operationalization of trauma (Cordon, Pipe, Sayfan, Melinder, & Goodman, 2004). Second, childhood trauma may increase risk for adult revictimization (Arata, 2002); thus, children of mothers with childhood trauma are more likely to experience a range of negative life events (Collishaw, Dunn, O'Connor, Golding, & the ALSPAC Study Team, 2007), all of which may further undermine maternal psychosocial functioning and interfere with child behavioral adjustment. Third, although the SEM provided high levels of statistical control, the correlational nature of the data limits the confidence in the causal direction between MCT, maternal psychological distress and social support, and child behavior. Fourth, our study is limited in separating the effect of maternal psychological distress from the valid context-specific variability in child behavior as a source of informant discrepancy. Nevertheless, maternal assessments of their children's behavioral problems are meaningful

to study, as it is these perceptions that shape maternal response and parenting practice. Furthermore, significant correlation between maternal and child measures of behavior provides validity to maternal reports not directly related to psychological distress. Finally, the sample composition and screening criteria limit the generalizability of the findings to high risk African American mothers with a history of substance use and their preadolescents of low SES in urban areas. Given that the majority of the mothers in the sample used substances during pregnancy, our findings may be confounded by prenatal drug exposure.

Despite these limitations, the present study provides evidence for the intergenerational effects of MCT, which was bolstered by the longitudinal nature of the data collected by multiple informants at 4, 6, and 9 years. A significant methodological advantage is the elimination of single source bias and shared method variance that often plagues other studies assessing the effect of MCT on child behavior. By simultaneously examining maternal and child self-report of child behavior, informant-specific explanatory links between MCT and children's preadolescent behavior were indicated, improving on previous studies (e.g., Dubowitz et al., 2001; Roberts et al., 2004) that relied on maternal report for both predictor and outcome variables.

The present study suggests increased attention is warranted to the importance of assessing MCT when working with mothers living in an urban low income community and of the significance of understanding trauma histories in the lives of mothers who seek assistance for parenting and child behavior problems. To promote competency and resiliency among children for whom MCT poses a risk to optimal development, a target intervention should include strengthening maternal social support. This study demonstrated that maternal social support may be a key pathway to improve preadolescent's behavioral adjustment, especially among at-risk families. In addition, maternal negative perceptions of child behavior will likely lead to greater parent-child conflict. Interventions designed to help mothers reduce psychological distress may improve their perception of their children's behavior, which may foster more optimal mother-child interactions.

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Declaration of Conflicting Interests

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