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The role of trauma symptoms in the development of behavioral problems in maltreated preschoolers☆

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ABSTRACT

Objective: This study assessed the mediating role of trauma symptoms in the relation between child maltreatment and behavioral problems. It is based on the postulate that child maltreatment is a severe form of chronic relational trauma that has damaging consequences on the development of children's behavioral regulation.
Method: Participants were 34 maltreated and 64 non-maltreated children (mean age = 60 months; range: 46 to 72 months), all from economically disadvantaged families. Maltreated children were recruited from the Child Protection Agencies. Behavioral problems and trauma symptoms were evaluated by the preschool teacher with the Internalizing and the Externalizing scales of the Child Behavior Checklist—Teacher Report Form (CBCL-TRF) and the posttraumatic stress score of the Trauma Symptoms Checklist for Young Children respectively (TSCYC).
Results: Baron and Kenny's mediational procedure was conducted using structural equation modeling. Mediational analyses revealed that trauma symptoms fully mediated the association between maltreatment and both internalizing and externalizing behaviors.
Conclusions: Results were consistent with the literature on developmental trauma research and provide empirical support to the idea that trauma-related symptoms resulting from early maltreatment may constitute a mechanism in the development of psychosocial problems in preschoolers.
Practice implications: These findings underline the importance of understanding psychosocial maladjustment of maltreated children not only from the perspective of problematic behavior, but also by taking into account the traumatic reactions that might develop in response to chronic and intense stress associated with abuse and neglect.

Introduction

Several studies have shown that maltreated children present more internalizing and externalizing problems than non-maltreated ones (Hildyard & Wolfe, 2002; Kim & Cicchetti, 2003; Manly, Kim, Rogosch, & Cicchetti, 2001; Shonk & Cicchetti, 2001; Toth, Cicchetti, Macfie, Rogosch, & Maughan, 2000). They also are at greater risk of having depressive symptoms (Cerezo-Jimenez & Frias, 1994; Toth, Manly, & Cicchetti, 1992), displaying aggressive behaviors (Hoffman-Plotkin & Twentyman, 1984; Johnson et al., 2002), showing signs of anger and frustration, disobeying (Egeland, Sroufe, & Erickson,

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1983) and demonstrating poor social skills (Darwish, Esquivel, Houtz, & Alfonso, 2001; Shields & Cicchetti, 2001). These problem behaviors can develop as early as the preschool-age (Darwish et al., 2001; Manly et al., 2001) and remain stable overtime in a certain proportion of children (Campbell, 1995).

Behavior and emotion regulation is an important aspect of psychosocial adjustment during the preschool period: children with behavioral problems are at greater risk of rejection by their peers and of being socially withdrawn (Bierman, 2004). Identifying the processes which underlie the development of internalizing and externalizing behavior problems in maltreated preschoolers is essential for both prevention of such problems and early identification of children at risk of psychosocial maladjustment. For the past 15 years, several studies conducted within the contemporary fields of pedopsychiatry, developmental psychopathology, and developmental traumatology have underlined the importance of the traumatic stress model as a useful conceptual framework to better understand psychosocial problems associated with experiences of maltreatment (Cook et al., 2005; De Bellis, 2001, 2005; Herman, 1992; Perry, 2008; Schore, 2001; van der Kolk, 2005). These studies are based on the postulate that maltreatment is a severe form of chronic interpersonal trauma which has multiple consequences on the development of emotional and behavioral self-regulation in children. In the present study, we use the traumatic stress model to examine the mechanisms associated with the development of behavioral problems in maltreated preschoolers.

Child maltreatment and trauma

Child maltreatment can be considered as a chronic interpersonal trauma, to which the child is exposed on a daily basis within the context of the caregiver-child relationship (De Bellis, 2001; Perry, 2008; van der Kolk, 2005). Maltreatment experiences create a double prejudice for it leaves children with little possibility of attaining affective security, because the parent—as a caregiver—is often both the source of alarm and the one providing comfort (Lyons-Ruth, Bronfman, & Atwood, 1999; Main & Hesse, 1990). This apparent irresolvable paradox may lead to attachment disorganization as suggested by the very high proportion of children classified as disorganized-disoriented in maltreated samples (Cicchetti, Rogosch, & Toth, 2006; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Children's capacity to adequately cope with stress depends largely on the nature of the stress and on the attachment figure's capacity to diminish or counter the effects linked to the stressor (Lyons-Ruth et al., 1999). Therefore, in addition to creating a state of stress in the child, maltreating parents fail to modulate/attenuate the stressor and they cannot provide the child with the necessary support to face and cope with the stress. Thus, maltreated children often do not have access to parental support to regulate and manage their stress, which places them at risk of experiencing severe and chronic states of stress that can have negative consequences on children's functioning (Schore, 2001). Whereas a single traumatic event—an accident or a natural disaster—can lead to a conditioning of physiological and behavioral responses linked to the event, chronic experiences of abuse and neglect might have a more deleterious effect on the development of emotional and behavioral self-regulation skills. According to Terr (1991), such traumatic experiences could result in "Type II trauma" which includes difficulties regulating emotional reactions, rage, dissociation, somatization, changes in perception of self and others, and changes in understanding and interpreting events. Within this perspective, consequences linked to maltreatment-related trauma would therefore be numerous and varied and would extend beyond the usual manifestations of re-experiencing, avoidance and hyper arousal symptoms that define the diagnosis of posttraumatic stress disorder (PTSD; DSM-IV; American Psychiatric Association, 1994). Consequences of chronic interpersonal trauma would permeate all spheres of child development: biological, psychological, behavioral, relational, social, cognitive, and self. This has led several authors to propose the expression "complex trauma" (Briere & Spinazzola, 2005; Cook et al., 2005; Herman, 1992) to describe the developmental consequences associated with chronic interpersonal trauma.

The notion of complex trauma provides a conceptual framework most relevant in the study of psychosocial problems associated with maltreatment-related trauma in children. However, despite its increasing popularity, few empirical studies have been conducted to clarify the interrelations among the numerous emotional, perceptual, cognitive and behavioral problems that characterize the complex trauma. Adopting a complex trauma framework, this study proposes that symptoms of re-experiencing, avoidance and hyper arousal which usually define PTSD might be involved in the development of behavioral problems in maltreated children. A common characteristic of these three trauma-related symptoms comes from the fact that they originate in situations of fear or intense stress. Because child abuse and neglect constitute a direct threat to physical and psychological integrity, these experiences are particularly conducive conditions for creating feelings of fear, horror or intense stress in children. Being assaulted, left alone or not having access to an available parent causes a feeling of intense stress, fear of abandonment or even a feeling of helplessness in children, which can be a very traumatic experience. Many studies have in fact shown that child neglect, as well as physical and sexual abuse, are associated with increased risk of developing PTSD in childhood, adolescence and adulthood (Adam, Everett, & O'Neal, 1992; Kendall-Tackett, Williams, & Finkelhor, 1993; Merry & Andrews, 1994; Runyon, Faust, & Orvaschel, 2002; Sullivan, Fehon, Andres-Hyman, Lipschitz, & Grilo, 2006; Widom, 1999). Symptoms of re-experiencing, avoidance and hyper arousal are indicators that children are still in stress mode and that an important part of their psychological resources are directed towards survival. Therefore the presence of such symptoms, especially in young children, might interfere with the development of emotional and behavioral regulatory processes.

This position is in line with the results of many published studies in the field of developmental traumatology which have observed a link between chronic exposure to stress, alterations of stress response systems and behavioral dysregulation (De

Bellis, 2001, 2005). These studies have shown that exposure to trauma can lead to particular alterations in the noradrenaline system, the hypothalamic-pituitary-adrenal (HPA) axis as well as in the normal functioning of hippocampus and amygdala (Bremner, 2007; Perry, 2008). Particularly strong effects have been observed among maltreated children diagnosed with PTSD (De Bellis et al., 1999; Tarullo & Gunnar, 2006; Tupler & De Bellis, 2006). Dysfunction of these systems and structures increases risk of depression, aggressiveness and hostile behavior (De Bellis, 2001, 2005).

In addition, several studies indicate a high prevalence of internalizing and externalizing behavioral problems in traumatized children (McLeer, Deblinger, Atkins, & Foa, 1988; McLeer et al., 1998; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002; Wolfe, Sas, & Wekerle, 1994). None of these studies used a mediation model to verify whether trauma symptoms could be a central mechanism contributing to the development of behavioral problems in maltreated preschoolers. However, this meditational hypothesis has received some support from studies which have examined links between trauma-related symptoms and psychosocial maladjustment in adolescence and adulthood. In a longitudinal study conducted with a large community sample of adolescents, Wolfe and colleagues found that trauma symptomatology mediated the relation between experience of childhood maltreatment and dating violence (Wekerle et al., 2001; Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004). The role of trauma symptomatology in psychosocial maladjustment has also been underlined by Holzer, Uppala, Wonderlich, Crosby, and Simonich (2008) who found a meditational effect of PTSD symptoms in the relation between sexual trauma (either in childhood or adulthood) and eating disorders in adulthood.

Alternatively, results from another study suggest that internalizing problems might constitute a risk factor for the development of PTSD symptoms. In a study conducted with traumatized children and adolescent hospitalized following a physical injury (e.g., victims of motor vehicle accident), Aaron, Zaglul, and Emery (1999) found that higher pre-trauma internalizing problems were associated with more trauma symptomatology 4 weeks following hospitalization. Taken together, these results and those from studies with maltreated populations might indicate that the directionality of effects between PTSD symptoms and behavior problems remains unclear.

However, it is important to note that the Aaron and colleagues' study assessed PTSD symptoms following the experience of a single potentially traumatic event that was not relational in nature. It is possible therefore that processes linking PTSD symptoms and behavioral problems operate differently in situations characterized by a single traumatic event and those involving chronic relational trauma such as in the context of child maltreatment.

The aim of this research is to evaluate the role of trauma symptoms, using a mediational model, in the development of behavioral problems in maltreated preschoolers. Trauma-related symptoms might be associated with the manner in which children cope with the different social and non-social normal stress factors which they are likely to encounter upon entering a preschool or daycare, such as having to establish new relationships with unknown peers and caretakers in an unfamiliar setting. In this study, we focus on maltreated children's psychosocial adaptation within the extra-familial context of the preschool setting. On the basis of previous studies with maltreated or sexually abused populations (Holzer et al., 2008; Wekerle et al., 2001; Wolfe et al., 2004) and consistent with the developmental traumatology model (De Bellis, 2001, 2005), we hypothesize that PTSD symptoms will mediate the link between maltreatment and child behavior problems. However, in light of Aaron and colleagues' results (Aaron et al., 1999), alternative models will also be examined in order to test the meditational role of behavior problems in the development of trauma-related symptoms in maltreated children.

Method

Participants

The initial sample was composed of 77 non-maltreated children (41 boys; mean age: 59 months; range: 46 to 72 months) and 34 maltreated children (19 boys; mean age: 60 months; range: 48 to 71 months), all from economically disadvantaged families. This study was approved by the ethical review boards of Le Centre jeunesse de la Mauricie et du Centre-du-Québec and the Université du Québec a Trois-Rivières. The sample is from a Caucasian francophone population living in an urban and rural region in the province of Québec (Canada). For the purposes of this study, only children who were living with their mother and who also attended a preschool center or kindergarten were selected. Prior to participating, written informed consent was obtained from all mothers.

Maltreated children were recruited from the Child Protection Services (CPS) in the Mauricie/Centre-du-Québec region and, at the time of the study, all were receiving services for maltreatment. For each child in the maltreated group, information on subtype of maltreatment was retrieved from CPS records (with mothers' informed consent). Child neglect was largely predominant in this sample: 28 children were neglected; 1 child was victim of physical abuse; 3 were victims of sexual abuse; 1 was both neglected and physically abused; and 1 was both neglected and sexually abused. Two reasons might explain this high proportion of neglect in our sample. First, in Canada, child neglect is by far the most prevalent form of child maltreatment at the preschool-age (Trocmé et al., 2005). Second, by excluding in our sample all children not living with their mother, we might by the same token have excluded children who lived in particularly violent homes and who were victims of multiple forms of maltreatment—since these children are more likely to be placed in foster care (Kinard, 2002).

Based on the widely documented fact that the majority of maltreating families come from low socioeconomic background (e.g., Cicchetti & Valentino, 2006; Trocmé et al., 2005), non-maltreated children in this study were mostly recruited among socioeconomically disadvantaged families through divers sources: (1) official lists of families who receive social welfare; (2) preschool centers and schools; and (3) Community Health and Social Services (CHSS). In the province of Quebec, CHSS

Table 1
Sociodemographic variables according to maltreatment status.

	Maltreated children ($N = 34$)		Non-maltreated children ($N = 64$)		χ^2
	N	%	*N*	%	
Boys	19	56	35	55	.1
Single-mother families	18	53	45	70	2.9
Welfare	25	74	38	60	1.9
Annual family income (under 25,000 CAD)	32	94	57	89	.7
	M	*SD*	*M*	*SD*	*t* (96)
Child's age (months)	60	(8.0)	59	(6.6)	−.46
Number of children	2.7	(1.5)	2.2	(1.0)	−1.79
Maternal education	9.4	(2.0)	10.8	(2.5)	2.67**
Maternal age at birth of first child	23.2	(5.3)	21.6	(4.8)	1.50

Note. CAD: Canadian dollars.
** $p < .01$.

offer a wide variety of health and social services to the community, targeting primarily vulnerable and socioeconomically disadvantaged families. In the context of CHSS, if the presence of maltreatment is suspected, the family is then referred to CPS. For all the children in the non-maltreated group, mothers' consent was obtained to establish through CPS records if children had ever received services from CPS for abuse or neglect. Two of them had already received such services and therefore were removed from the sample. Finally, because several cases of child abuse remain undetected by Protection agencies, mothers of the control group were also asked to complete the severe physical assault subscale of the *Parent-Child Conflict Tactic Scale* (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998), a questionnaire which evaluates strategies used by the adults of the household to solve conflicts with their children. Eleven mothers reported that an adult in the home had used severe violence towards the child during the last 12 months (for example: slapped him/her on the face or head or ears; hit him/her with a fist or kicked him/her hard). These 11 children represented an at-risk group and they were therefore removed from the sample for the following reasons. First, they were different from non-maltreated children because they had experienced at least 1 episode of severe physical discipline. Second, although they were victims of such severe physical discipline during the last year, specific behaviors assessed by the CTSPC may not necessarily meet CPS criteria for abuse. Consequently, it is not possible to conclude with any kind of certainty that their situation was similar to that of maltreated children identified through CPS. The decision to withdraw these at-risk children served to provide greater homogeneity in each of the groups. There was no significant difference between the children removed from the study and the remaining sample on the sociodemographic variables measured in this study.

Mothers also consented that their child's preschool or kindergarten teacher be contacted by the research team to answer questionnaires on the child's behavior in the classroom. Teachers evaluated children's behavior problems and trauma symptoms through questionnaires. They were not informed by the research team about the maltreatment status of children (maltreated or non-maltreated). Also, it is not a usual practice for CPS to inform teachers about a child's referral, particularly when the child is still living with his/her family (which was the case for the children participating in this study). Therefore, most teachers, if not all, were unaware of children's maltreatment status.

The final sample therefore consisted of 64 non-maltreated children (35 boys; mean age: 59 months) and 34 maltreated children (19 boys; mean age: 60 months). The two groups did not differ on gender composition, child age, proportion of mothers on welfare, annual family income, proportion of single-mother families and maternal age at birth of the first child (see Table 1). Mothers of maltreated children, however, were significantly less educated than those of non-maltreated children.

Measures

Parent-Child Conflict Tactic Scale (CTSPC; Straus et al., 1998). The CTSPC is a questionnaire with 20 items which measure the strategies of conflict resolution used by the adults in the home during a conflict with the child. The mother must respond to each statement and indicate how often the resolution strategy had been used during the past year. The CTSPC consists of 4 subscales: nonviolent discipline, psychological aggression, corporal punishment, and severe physical assault. This study used the CTSPC to identify which children had been victims of at least 1 episode of severe physical violence during the past year (for example: slapped him/her on the face or head or ears; hit him/her with a fist, or kicked him/her hard). As mentioned earlier, these children were excluded from the study. Studies have demonstrated that the CTSPC is a useful instrument to identify the presence of maltreatment in the general population (Straus et al., 1998).

Trauma Symptom Checklist for Young Children (TSCYC; Briere, 2001). The TSCYC is a 90-item questionnaire which measures the presence in young children of trauma symptoms related to experiences of maltreatment and trauma. In this study, only the 27 items which make up the scales associated with the 3 main manifestations of posttraumatic stress disorder were used (re-experiencing, avoidance, and hyper arousal; American Psychiatric Association, 1994). The TSCYC also yields a global

scale of trauma symptoms composed of the total sum of the 3 scales (re-experiencing, avoidance, and hyper arousal). This questionnaire was completed by the child's preschool teacher who was asked to respond to each statement on a scale of 1 to 4, where 1 corresponds to "never" and 4 to "always." The TSCYC is a well-normed measure which permits transformation of raw scores into T scores. Those are provided in the TSCYC's manual. The TSCYC possesses excellent psychometric qualities (Briere et al., 2001; Gilbert, 2004). For the present study, the internal consistency indices (Cronbach's alpha) were .82 for re-experiencing, .78 for avoidance, and .85 for hyper arousal. Due to the presence of moderate to high correlations between each subscale (from $r = .48$ to $r = .63$), and of high correlations between each subscale and the global scale (from $r = .74$ to $r = .90$), only the global scale was retained for mediation analyses.

Child Behavior Checklist 1 1/2-5 years Teacher Report Form (CBCL-TRF; Achenbach & Rescorla, 2001). The CBCL-TRF contains 100 items which measure preschooler behavioral problems and is completed by children's preschool teacher. Preschool teacher must respond to each statement on a scale of 0 to 2, where 0 corresponds to "never," 1—"sometimes," and 2—"often." Measured behaviors cover different psychosocial areas such as withdrawal, somatization, anxiety, and aggression. These are then regrouped into two global scales: internalizing (emotionally reactive, anxious/depressed, withdrawn, and somatic complains) and externalizing (attention problems and aggressive behaviors). Since the CBCL-TRF and the TSCYC share 7 almost identical items, those were removed when calculating CBCL-TRF scales in order to avoid any artificial sharing of variance between the 2 questionnaires (Q.5. Can't concentrate; Q.6. Can't sit still; Q.47. Nervous; Q.51. Panics; Q.64. Easily distracted; Q.87. Fearful; Q.99. Worries). The CBCL-TRF is a well-normed measure which permits transformation of raw scores into *T* scores. However, with the withdrawal of 7 items, those transformations were not possible and raw scores were retained for analysis. Cronbach's alpha applied to the new scales revealed a very high index of internal coherence of internalizing (Cronbach's alpha = .88) and externalizing (Cronbach's alpha = .96) scales.

Data analysis

Test of study hypothesis: Mediating role of trauma symptoms. The mediator effect of trauma symptoms on the relation between maltreatment and internalizing and externalizing behavior problems was tested according to Baron and Kenny's four mediation conditions (Baron & Kenny, 1986): (1) a significant effect of the independent variable on the dependent variable in the absence of mediator variable; (2) a significant effect of the independent variable on the mediator variable; (3) a unique contribution of the mediator on the dependent variable; and 4) a significant decrease of effect of the independent variable on the dependent variable when the mediator is added to the model. In our sample, the correlations between CBCL-TRF internalizing and externalizing scales were relatively high ($r = .65$; $p < .001$). Mediation analyses were therefore conducted using structural equation modeling (SEM) with EQS (Bentler, 1995). A correlational model was created that allowed testing for both internalizing and externalizing mediation paths at the same time while respecting Baron and Kenny's procedure. A first model, "direct paths model—mediator paths removed" tests the first condition. Then a second model, "mediational model" allows for the verification of the other three conditions. Upon applying this procedure, the Sobel test (Sobel, 1982) insures that the relation between the independent and the dependent variables is explained by the mediator variable. Because examination of variable normality showed that certain variables did not follow normal distribution, robust estimates of standard deviations were used to calculate coefficients so as to compensate for the lack of normality. When using robust estimates to calculate coefficients, Satorra and Bentler (2001) suggest using Satorra-Bentler scaled chi-square rather than the usual chi-square when measuring the degree of model adjustment.

Test of alternative models: Mediating role of behavior problems. A similar procedure was used to test two alternative models involving externalizing and internalizing behavior problems as potential mediators in the association between maltreatment and PTSD symptoms.

Results

Control variables

Before performing the mediation analyses, interrelations between sociodemographic and the dependent and mediator variables were examined in order to identify covariates to be included as control variables in the mediation analyses (see Table 2). Results revealed that internalizing and externalizing behavior problems correlated with child's sex and maternal education, with boys showing more internalizing and externalizing behaviors than girls, and mothers with lower level of education having children with more internalizing and externalizing symptoms. However, since maternal education was linked to both independent and dependent variables, the relation of maternal education will be considered only for maltreatment status (Tabachnick & Fidell, 2007). Externalizing problems also correlated with maternal age at birth of first child, with younger mothers having children with more externalizing problems. Total PTSD symptoms correlated with both child age and family status, with younger children and children living in biparental families having higher scores on TSCYC. These variables were therefore included in the mediator model as follows: (1) sex in relation to internalizing and externalizing problems; (2) association of maternal age at birth of first child with externalizing problems; (3)

Table 2
Correlations between sociodemographic variables and behavioral problems and PTSD symptoms.

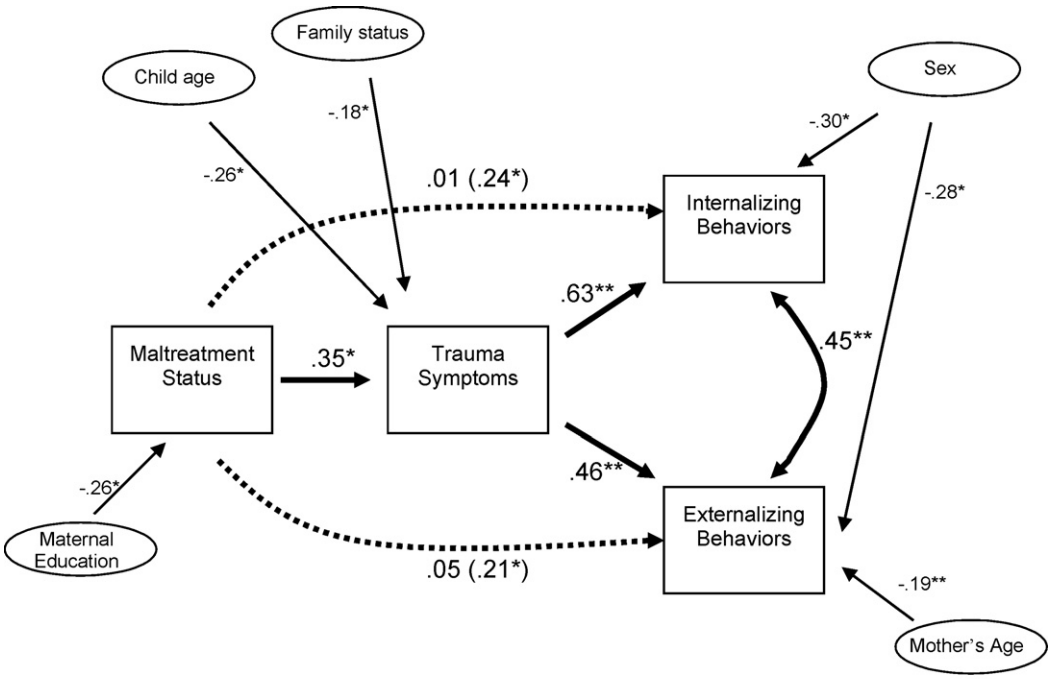
	CBCL-TRF		TSCYC
	Internalizing	Externalizing	Total
Child's sex	−.29**	−.29**	.03
Single-mother	−.09	−.07	−.22*
Welfare	−.18	−.12	−.07
Total income (under 25,000 CAD)	−.05	−.09	−.02
Child's age	−.15	−.16	−.23*
Number of children	.05	−.05	.08
Maternal education	−.22*	−.23*	−.15
Maternal age at birth of first child	−.01	−.23*	−.09

Note. CBCL-TRF: Child Behavior Checklist – Teacher Report Form; TSCYC: Trauma Symptoms Checklist for Young Children. Child's sex: 0 = male; 1 = female.
* $p < .05$.
** $p < .01$.

maternal education in relation to maltreatment status; and (4) associations of child age and family status with trauma symptoms.

Mediation analyses

Mediating role of trauma symptoms. Estimates of the direct paths model using SEM revealed a direct and significant relation between maltreatment and internalizing and externalizing problems, thus respecting the first condition (model not shown, but see numbers in parentheses in Figure 1 for betas associated with direct paths model). Maltreated children presented significantly more internalizing and externalizing problems than non-maltreated children (see Table 3 for descriptive statistics). Without mediator involvement, the direct paths model—meditational paths removed provided a relatively good fit to the data [Satorra-Bentler chi-square: $\chi^2(8) = 14.97$, *ns*; CFI = .91; RMSEA = .10, AIC = −1.03].



Note: Satorra –Bentler chi-square(24) = 26.2, n.s., CFI = .985, RMSEA = .03, AIC = -21.79.
Numbers in parenthesesrefer to betas from direct paths model –mediation paths removed.
Circles = control variables. Dot lines = non significant paths.Child's sex: 0 = male;
1 = female. Family status: 0 = biparental; 1 = monoparental.
* p < .05. ** p < .01.

Figure 1. Mediational model of trauma symptoms on the relation between child maltreatment and behavior problems.

Table 3
Behavioral problems and PTSD symptoms according to maltreatment status.

	Maltreated children ($N = 34$)		Non-maltreated children ($N = 64$)	
	M	*SD*	*M*	*SD*
CBCL – Internalizing (raw scores)	11.1	6.9	7.3	7.2
CBCL – Externalizing (raw scores)	14.2	13.9	8.2	9.8
TSCYC – Total PTSD (*T* scores)	58.9	14.9	48.9	10.6

Note. CBCL-TRF: Child Behavior Checklist – Teacher Report Form; TSCYC: Trauma Symptoms Checklist for Young Children.

The mediational model showed complete mediation by trauma symptoms of the association between maltreatment and internalizing as well as externalizing problems. As can be seen in Figure 1, when trauma symptoms were added in the model, the relations between maltreatment and internalizing and externalizing problems were no longer significant (condition 2). The mediational model also revealed a significant link between child maltreatment and trauma symptoms (condition 3) and between trauma symptoms and both internalizing and externalizing problems (condition 4). Results thus revealed that child maltreatment was associated with higher scores of internalizing and externalizing behavior problems, through the mediation of higher trauma symptoms. Adjustment indicators also showed that the mediational model provided an excellent fit to the data [Satorra-Bentler chi-square: $\chi^2(24) = 26.2$, *ns*; CFI = .985; RMSEA = .03, AIC = −21.79]. The mediating role of trauma symptoms in the associations between maltreatment and internalizing and externalizing problems was confirmed by Sobel tests (Sobel test = 2.48; $p < .01$ and Sobel test = 2.18; $p < .05$, respectively). Similar results were obtained when mediational analyses were performed separately for each PTSD subscale (re-experiencing, avoidance, and hyper arousal). Estimates for mediational models revealed complete mediation of each subscale for both internalizing and externalizing problems. Adjustment indicators also showed that the mediational models involving these subscales provided a good fit to the data [all Satorra-Bentler $\chi^2(24) < 34.7$, *ns*; all CFI > .88; all RMSEA < .08; all AIC < −13.30].

Alternative models: Behavior problems as a mediator. Alternative meditational models were also tested to examine whether the relation between maltreatment and PTSD symptoms could be mediated by the presence of behavior problems. Results revealed partial mediation. However, the mediational model for externalizing behavior problems provided a less accurate fit to the data than the previous model (involving PTSD as the mediator) as revealed by increased chi-square, RMSEA and AIC and decreased CFI [Satorra-Bentler $\chi^2(24) = 36.6$, *ns*; CFI = .915; RMSEA = .07, AIC = −11.63]. As for internalizing problems, adjustment indicators showed a poor fit to the data as suggested by a significant chi-square [Satorra-Bentler $\chi^2(24) = 36.5$, $p < .05$; CFI = .913; RMSEA = .07, AIC = −11.38].

Discussion

The aim of this study was to evaluate the mediating role of trauma symptoms in the development of internalizing and externalizing behavioral problems in maltreated preschoolers.

Results first confirmed, in line with previous studies, links between maltreatment and teacher reports of child internalizing and externalizing problems (de Paul & Arruabarrena, 1995; Reyome, 1993). As expected, results also revealed a significant association between child maltreatment and trauma symptomatology, with maltreated children perceived by their preschool teacher as displaying more trauma symptoms than non-maltreated children. This finding lends further support to the idea put forth by some authors to consider child maltreatment from a developmental trauma perspective. Within this perspective, child maltreatment is viewed as a major life stressor and a potentially traumatic situation that may strongly impair child development and functioning (Briere & Spinazzola, 2005; Cook et al., 2005; van der Kolk, 2005). Indeed, empirical evidence indicates that maltreated children are at risk of developing posttraumatic stress disorder (Kendall-Tackett et al., 1993; Merry & Andrews, 1994; Runyon et al., 2002). Moreover, with most children in the maltreated sample being neglected, this study provides further evidence that parental failure to provide basic needs may also constitute a sufficiently stressful context for developing trauma symptomatology. Although several studies have shown the heuristic value of the traumatic stress model for the study of child maltreatment, few studies have used samples of neglected children. Therefore, less is known about childhood PTSD symptoms in among these children. It is interesting to note that, in the current study, manifestations of trauma symptoms in maltreated children were sufficiently obvious as to be observed in an extra-familial context despite the absence in the preschool setting of the major characteristics associated to the traumatic experiences of maltreatment (attachment figures, parental behaviors, affective family climate).

Results supported our theoretically-driven and empirically-based hypothesis concerning the mediating role of trauma symptoms in the relation between internalizing and externalizing behavioral problems among maltreated children. Our analyses of alternative mediational models revealed that behavior problems only partially mediated the association between maltreatment and PTSD symptoms. In addition, these alternative models provided a less accurate fit to the data than the model involving trauma symptoms as the mediator of behavior problems. The results of these different mediational analyses therefore support the mediating role of traumatic symptomatology for psychosocial adjustment in the context of maltreatment which is considered a potential chronic interpersonal trauma. These findings are consistent with those of previous studies which have evaluated the mediating role of posttraumatic stress symptomatology in the development of psychoso-

cial maladjustment among adolescent or adult samples (Holzer et al., 2008; Wekerle et al., 2001; Wolfe et al., 2004). To our knowledge, the current study is the first to have examined with the use of mediational analyses the contribution of trauma symptomatology in the development of early psychosocial problems among maltreated preschoolers. Taken together, our findings along with the results of previous studies provide empirical support to the idea that trauma-related symptoms resulting from early maltreatment experiences is an important mechanism associated with psychosocial problems at various developmental stages during the course of life.

The complex trauma literature suggests that experiences of abuse and neglect in early childhood have a pervasive negative impact that goes beyond the PTSD symptoms. Accordingly, the complex trauma symptoms resulting from childhood maltreatment encompasses deficits at the emotional, relational, behavioral and cognitive levels that will significantly impair psychosocial functioning. Examples of such psychosocial problems include difficulties in regulating emotions, explosive anger, dissociation, alterations in the relationships with others, distrust and identification with the perpetrator (Cook et al., 2005; van der Kolk, 2005; Briere & Spinazzola, 2005). To date, empirical studies using a complex trauma paradigm have not directly addressed the question of how these various difficulties emerge and develop. What are the processes and mechanism associated with such poor developmental outcomes? Our study helps to shed some light on this question. The results of the mediational analyses suggest that PTSD symptoms play a central role in the development of psychosocial difficulties in the form of externalizing and externalizing problems among maltreated preschoolers. Maltreated children are consistently exposed to very stressful situations which result in traumatic symptoms. Being aggressed, left alone and without access to an available parent may result in feelings of intense stress, fear of abandonment or even helplessness in the young child. Reactions to stressful situations may vary as a function of the intensity and the severity of the situation. Furthermore, children are particularly dependent on their caregivers to maintain or regain homeostasy when faced with very stressful situations (Lyons-Ruth et al., 1999). According to attachment theory, the child's regulation of stressful arousal occurs in the context of day-to-day interactions with the caregiver (Bowlby, 1980). However, in the context of maltreatment, which is characterized by severe disruptions in the parent-child relationship, the child has few internal and social resources for coping with the stress and integrating the traumatic experience in a coherent fashion. Pervasiveness of the feelings of fear and stress may potentially develop into trauma-related symptoms which will likely impair the development of emotional and behavioral regulatory skills.

Practice implications

Practice implications stemming from these results are of great interest. Findings of this study underline the importance of understanding psychosocial maladjustment of maltreated children not only from the perspective of problematic behavior, but also by taking into account the traumatic reactions that might develop in response to chronic and intense stress. Our results are consistent with empirical evidence which suggests that intervention strategies which focus on trauma-related symptomatology may also improve more general functioning in traumatized children. Particularly, trauma-focused cognitive-behavioral therapy (CBT) has been shown to be effective in reducing PTSD symptomatology as well as internalizing and externalizing behavior problems in sexually abused preschoolers (Cohen & Mannarino, 1996). Consequently, interventions targeting maltreated children with behavior problems should be multi-modal and eventually address the traumatic experience. Traumatic content—which often relates to painful emotions, images and memories—is too overwhelming for children to face alone. Therefore, support from trustworthy persons is necessary for this content to be tackled in therapy. The development of a secure relationship with the therapist is a core feature of existing intervention programs designed for traumatized children (Cohen, Deblinger, Mannarino, & Steer, 2004; Cook et al., 2005). This supporting relationship will help the child develop the emotional regulatory skills necessary to cope with overwhelming feelings. Finally, in addition to implementing child psychotherapy, intervention strategies should also target the family and aim at improving the quality of the parent-child relationship.

Limits of the study

There are certain limits to consider when interpreting the results of this study. First, because all measures were concurrent, direction of effects must be interpreted with caution. However, examination of different mediational models tended to support PTSD symptoms as a possible mechanism related to behavioral problems in maltreated preschoolers. A second limitation comes from the fact that behavioral and trauma symptomatology were both evaluated by the child's preschool teacher. Thus, we cannot entirely rule out the possibility that a bias related to the evaluator might have inflated the association found between trauma symptoms and behavior problems. However, to minimize this possible bias effect, items present in both the TSCYC and the CBCL-TRF were removed from the internalizing and the externalizing scores of the CBCL-TRF, thus limiting shared variance between the two measures. An additional limitation pertains to the use of a questionnaire to assess trauma symptoms in children. Although the TSCYC has good psychometric properties, it relies primarily on the evaluator's knowledge of the child and ability to detect traumatic behavioral manifestations. The use of well-validated clinical interviews could constitute a more sensitive measure for the evaluation of traumatic symptomatology in children. Yet another limitation comes from the fact that no evaluation of traumatic events other than maltreatment (e.g., exposure to marital violence, violence in the community) was included in the study; therefore, it was not possible to verify that traumatic manifestations observed in children were effectively linked to having experienced abuse or neglect, and not the result of a larger context of

trauma. Finally, although we used maternal reports of abuse via the CTSPC to exclude potentially abused children from the non-maltreated group, recent findings suggest being careful while using this instrument. In a study assessing the specificity and the sensitivity of the CTSPC, Bennett, Sullivan, and Lewis (2006) found that some mothers involved with CPS report using less physical assault towards the child than mothers of non-maltreated children.

Future directions

The major contribution of this study is having highlighted the central role of trauma-related symptoms in the development of both internalizing and externalizing problems in young maltreated children. Future studies should focus on how developmental consequences of traumatic stress may vary as a function of dimensions of child maltreatment (i.e., chronicity, severity, and age of onset). Several studies have found differential impact on behavioral and traumatic symptomatology according to dimensions of child maltreatment (Éthier & Milot, 2009; Kotch et al., 2008; Éthier, Lemelin, & Lacharité, 2004; Macfie, Cicchetti, & Toth, 2001; Manly et al., 2001; Yeager & Lewis, 1996). Unfortunately, in this study, this information was not available. Future research may reveal some specificity in the underlying processes of complex trauma according to the nature of maltreatment experiences.

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