Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample

Jessica Pereira\textsuperscript{a}, Kristin Vickers\textsuperscript{b}, Leslie Atkinson\textsuperscript{b,∗}, Andrea Gonzalez\textsuperscript{c}, Christine Wekerle\textsuperscript{c}, Robert Levitan\textsuperscript{d}

\textsuperscript{a} Human Development and Applied Psychology, University of Toronto, Toronto, Ontario, Canada
\textsuperscript{b} Institute for Stress and Wellbeing Research and Department of Psychology, Ryerson University, Toronto, Ontario, Canada
\textsuperscript{c} Department of Psychiatry and Behavioural Neuroscience, McMaster University, Hamilton, Ontario, Canada
\textsuperscript{d} Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada

\textbf{ARTICLE INFO}

Article history:
Received 4 August 2011
Received in revised form 24 January 2012
Accepted 28 January 2012
Available online xxx

Keywords:
Maltreatment history
Parenting stress
Maternal sensitivity
Statistical mediation

\textbf{ABSTRACT}

\textbf{Objective}: Maternal maltreatment history and current parenting stress are associated with parenting difficulties. However, researchers have not investigated the mechanism by which these variables are interlinked. We hypothesized that parenting stress mediates the relation between history of maltreatment and parenting behavior.

\textbf{Methods}: We assessed a community sample of 291 mothers as they interacted with their 16-month old infants in the home. Maternal history of maltreatment and parenting stress were assessed via self-report inventory; maternal sensitivity toward the infant was assessed with 2 h of direct behavioral observation.

\textbf{Results}: Mothers who reported more maltreatment in childhood were less sensitive with their infants; mothers who reported more current parenting stress were also less sensitive. Parenting stress mediated between maternal maltreatment history and current parental behavior.

\textbf{Conclusions}: Findings are consistent with an interpretation of parenting stress as a pathway through which maternal history of maltreatment may be linked to decreased maternal sensitivity.

© 2012 Elsevier Ltd. All rights reserved.

\section*{Introduction}

Central to the construct of stress is the perception that pressures exceed coping ability. Distinct from other domains (Deater-Deckard, 1998), parenting stress involves the perspective that caregiving demands surpass available resources. Parenting stress is related to less nurturing behavior, less pleasure in parent-child interactions, more parent-infant conflict, and frank abuse (Abidin, 1995; Gutermuth Anthony et al., 2005; Huth-Bocks & Hughes, 2008; Rodgers, 1998; Taylor, Guterman, Lee, & Rathouz, 2009). However, the research typically targets high-risk samples (e.g., low income, single parent, high unemployment: Rodgers, 1998; Taylor et al., 2009) with a single research methodology, self-report (Deater-Deckard & Scarr, 1996; Taylor et al., 2009).

No study has simultaneously assessed maltreatment history and parenting stress as they relate to parenting in a low-risk sample. We hypothesized that parenting stress mediates the relation between maternal maltreatment history and parenting. We reasoned as follows: (1) childhood maltreatment is an extreme stressor that deleteriously affects subsequent coping,
as manifested in long-term stress physiology (MacMillan et al., 2009) and increased health risk behaviors and medical and psychiatric difficulties (Watts-English, Fortson, Gibler, Hooper, & De Bellis, 2006). (2) The transition to parenthood can be challenging (Perren, Von Wyl, Burgin, Simoni, & Von Klitzing, 2005), with declines in marital satisfaction and quality of spousal interaction (Bradbury, Fincham, & Beach, 2000), particularly for those who have experienced child maltreatment (Deater-Deckard, 2004). (3) Increased parenting stress is related to parenting difficulties (as discussed above). Therefore, we hypothesized that maternal history of childhood maltreatment influences stress reactivity, which, in turn, influences parenting. To our knowledge, there has been no empirical demonstration of a mechanism linking maltreatment history to subsequent parenting in humans.

**Methods**

**Participants**

Following Research Ethics Board approval, we recruited 291 mother-infant dyads from community centers, mother-infant activity centers, and consumer baby shows across an urban and suburban area. Mothers signed a statement of informed consent on the home visit. Mothers were 18 years or older at childbirth, with no known psychiatric disorder and with sufficient English to complete questionnaires. They were an average of 33.38 years old (SD = 4.35). Most were Caucasian (67.2%), though the sample included Asian (13.2%), Hispanic (5.6%), East Indian (3.8%), mixed ethnicity (3.8%), African (2.8%), Native North American (6%), and self-identified “Other” (3.1%) participants. Most (94.8%) women were currently in a relationship. The median family income was $114,000–149,999 Canadian, with 25th and 75th percentiles of $92,000–113,999 and $150,000–199,999. Infants were full term and healthy. They were an average of 15.98 months (SD = 1.37); about half (50.9%) were male. Most (57.2%) had no siblings, 17.1% had 2 or 3, and .9% had 3 or 4 siblings. Demographically, the sample is low risk.

**Measures**

**Childhood Trauma Questionnaire (CTQ).** The CTQ (Bernstein & Fink, 1999) is a 28-item self-report inventory assessing history of childhood maltreatment. The CTQ is psychometrically sound in community samples, with good internal and test-retest reliability (Paivio & Cramer, 2004) and convergent and discriminant validity (Bernstein et al., 1994). The CTQ total score, which we used here to encompass varied forms of maltreatment, had good internal reliability in the current sample, $\alpha = .93$.

**Parenting Stress Index-Short Form (PSI-SF).** The PSI-SF (Abidin, 1995) is a 36-item self-report inventory assessing degree of stress experienced in parenting. The PSI-SF provides a total parenting stress score based on the sum of subscales that comprehensively encompass multiple aspects of parenting stress, such as Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child. The PSI-SF has adequate internal consistency (Abidin, 1995; Gutermuth Anthony et al., 2005; Reitman, Currier, & Stickle, 2002) and retest reliability (Abidin, 1995; Haskett, Ahern, Ward, & Allaire, 2006). In the current sample, total PSI-SF $\alpha = .88$.

**Maternal Behavior Q-Sort, Version 3.1 (MBQS).** The MBQS (Pederson, Moran, & Bento, 1999; Pederson et al., 1990) is an observational coding instrument for assessing maternal sensitivity. The MBQS assesses caregiver responsiveness, warmth, and timeliness to infant cues. Observers sort 90 cards, each describing a particular behavior, into 9 piles of 10, with piles denoting “most like” to “least like” mother. A single score is derived from the MBQS, ranging from $-1.00$ to $+1.00$, depending on how the sort for a particular mother correlates with a prototypically ideal sort. The MBQS is reliably linked to infant socioemotional (Atkinson et al., 2000) and cognitive (Tarabulsy et al., 2009) development.

In the current study, 2 observers, blind to other measures, made a 2-hr visit to the home for MBQS observation. Mother was instructed to carry out her usual routine and interact with her baby as she typically would for most of this time. A 6-min toy frustration procedure was embedded in the observation period (the mother alternately gave and deprived her infant of a toy), as was a 20-min period wherein mother responded to questionnaires while her infant was present. These procedures were intended to introduce some stress into the interaction, important given our focus on the mediating role of parenting stress. The MBQS observers attained inter-observer total score agreement of $r = .88$.

**Results**

**Descriptive statistics and study variables**

CTQ total scores ranged from 25 to 112 ($M = 35.68$, $SD = 12.99$). Most mothers reported none to minimal maltreatment across the 5 subscales (see Table 1).

PSI-SF total scores ranged from 41 to 110 ($M = 65.97$, $SD = 13.84$). Only 5.16% ($n = 15$) of mothers had total stress scores in the clinical range (raw score $> 90$; Abidin, 1995).

MBQS scores ranged from $-69$ to $.90$ ($M = .47$, $SD = .34$). We log transformed to reduce skew.
Table 1  Distribution of participants’ experience of maltreatment across abuse subtypes on the Childhood Trauma Questionnaire.

<table>
<thead>
<tr>
<th>Type of abuse</th>
<th>None or minimal</th>
<th>Low to moderate</th>
<th>Moderate to severe</th>
<th>Severe to extreme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Abuse</td>
<td>201(69.1%)</td>
<td>58(19.9%)</td>
<td>13(4.5%)</td>
<td>19(6.5%)</td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>247(84.9%)</td>
<td>25(8.6%)</td>
<td>7(2.4%)</td>
<td>12(4.1%)</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>242(82.8%)</td>
<td>17(5.8%)</td>
<td>11(3.8%)</td>
<td>22(7.6%)</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>195(67.0%)</td>
<td>73(25.1%)</td>
<td>8(2.7%)</td>
<td>15(5.2%)</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>230(79.0%)</td>
<td>33(11.3%)</td>
<td>19(6.5%)</td>
<td>9(3.1%)</td>
</tr>
</tbody>
</table>

Note: Number of participants (percentage of participants).

Table 2  Intercorrelations amongst scales and subscales.

<table>
<thead>
<tr>
<th>Parenting Stress Index</th>
<th>Childhood Trauma Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Parenting Stress Inventory</td>
<td></td>
</tr>
<tr>
<td>1. Parental Distress</td>
<td>–</td>
</tr>
<tr>
<td>2. Dysfunctional Interaction</td>
<td>.42*</td>
</tr>
<tr>
<td>3. Difficult Child</td>
<td>.52*</td>
</tr>
<tr>
<td>PSI Total Score</td>
<td>.86*</td>
</tr>
<tr>
<td>Childhood Trauma Questionnaire</td>
<td></td>
</tr>
<tr>
<td>5. Emotional Abuse</td>
<td>.34*</td>
</tr>
<tr>
<td>6. Physical Abuse</td>
<td>.26*</td>
</tr>
<tr>
<td>7. Sexual Abuse</td>
<td>.14*</td>
</tr>
<tr>
<td>8. Emotional Neglect</td>
<td>.33*</td>
</tr>
<tr>
<td>9. Physical Neglect</td>
<td>.21*</td>
</tr>
<tr>
<td>10. CTQ Total Score</td>
<td>.34*</td>
</tr>
</tbody>
</table>

Note: BDI: Beck Depression Inventory-2 (Beck et al., 1996); PSI: Parenting Stress Index (Abidin, 1995); CTQ: Childhood Trauma Questionnaire (Bernstein & Fink, 1990); MBQS: Maternal Behavior Q-Sort, Version 3.1 (Pederson et al., 1990).

*p < .05.
**p < .005.

Univariate associations among study variables

Intercorrelations are shown in Table 2. CTQ subscale scores were significantly intercorrelated, and all subscale scores correlated significantly with the total CTQ score. Similarly, PSI subscale scores were significantly intercorrelated, as were PSI subscale scores and total score. We use total CTQ and PSI scores in the mediation analyses. Correlations amongst CTQ total score, PSI-SF total score, and MBQS score were significant (Table 2).

Assessing for confounds

To ensure that demographic features did not confound results, we assessed CTQ, PSI-SF and MBQS rating against maternal marital status, family income, infant sex, and number of siblings. These relations were not significant.

Testing the indirect effect of maltreatment history on parenting via parenting stress

We assessed the indirect effect of maltreatment history on parenting using ordinary least squares regression with bootstrapping (Hayes, 2009, 2011). (1) Assessing the relation between maltreatment history and parenting stress, beta = .31, standard error (SE) = .06, t = 5.08, p < .00005. (2) Assessing the direct effect of parenting stress on maternal sensitivity, beta = −.001, SE = .0004, t = 2.28, p < .025. (3) Assessing the total effect of maltreatment history on parenting, beta = −.0009, SE = .0004, t = 2.15, p < .05. (4) Assessing the direct effect of maltreatment history on maternal sensitivity (i.e., the effect of maltreatment history on maternal sensitivity, independent of parenting stress), beta = −.0006, SE = −.0004, t = 1.42, p = .16; when parenting stress is entered into the equation, the association between maltreatment history and maternal sensitivity drops to nonsignificance. Bootstrap sampling (based on 5,000 resamples; Hayes, 2011) indicated that the effect of parenting stress on maternal sensitivity was significant, 95% bias corrected confidence intervals = −.0006 to −.0001. These analyses verify the hypothesized model, indicating that maltreatment history has an indirect effect on maternal sensitivity via parenting stress. [We also examined alternative explanations to assess the discriminant validity of the model described above. We entered parenting stress as a moderator, as opposed to mediator, but the regression equation was not significant. We also entered depression (Beck Depression Inventory-2: Beck, Steer, & Brown, 1996) as an alternate mediator but again, the model did not prove significant. The latter finding is consistent with recent work showing that depression did not explain variance beyond that contributed by parenting stress (Taylor et al., 2009).] Although significant, F(2, 289) = 5.18, p < .01, the regression model only accounts for 3.3% of the variance.

Please cite this article in press as: Pereira, J., et al. Parenting stress mediates between maternal maltreatment history and maternal sensitivity in a community sample. Child Abuse & Neglect (2012), http://dx.doi.org/10.1016/j.chiabu.2012.01.006
Discussion

We found that mothers who reported greater childhood maltreatment endorsed higher parenting stress and were rated as less sensitive with their infants. Similarly, mothers who reported greater parenting stress were less sensitive with their infants. Examining the joint effect of both risk factors on maternal sensitivity, maltreatment history did not contribute unique variance beyond that explained by parenting stress. Instead, parenting stress significantly mediated the relation between history of maltreatment and maternal sensitivity. The model provides a parsimonious explanation of the link between early adversity and later parenting. It suggests that maltreatment predisposes individuals to stress reactivity, which is exacerbated by parenting, which, in turn, undermines sensitivity. This explanation is consonant with animal research showing that early experiences influence subsequent parenting via stress physiology (Francis, Diorio, Liu, & Meaney, 1999). The model presented here presents a basic platform that can be easily explored and expanded to incorporate additional mediators and moderators. As far as we know, it is the first study to empirically demonstrate a potential mediating mechanism between maternal maltreatment history and subsequent parenting of infants.

The model is important in terms of designing interventions to disrupt the intergenerational impact of maltreatment. It identifies a feasible intervention target, parenting stress, vital because the history of child maltreatment is a fait accompli. In this regard, Huebner (2002) showed that a brief, inexpensive education program aimed at parenting stress alleviated parenting stress itself and improved parenting (as assessed by scales incorporating, for example, maternal responsiveness, avoidance of punishment, organization of the environment, and teaching). This finding held across diverse populations (Huebner, 2002).

Our mediation findings, embedded in a demographically low risk sample (no known psychiatric disorder, majority of women currently in relationship, high median salary), also support the value of universal parenting programs (Guterman Harmer, Sanderson, & Mertin, 1999). Although many interventions target at-risk mothers (Bohr, Halpert, Chan, Lishak, & Brightling, 2010; Moss et al., 2011), community-accessible parenting programs have extensive benefits. For example, Zubrick et al. (2005) demonstrated the influence of a universally implemented parenting program (Triple P—Positive Parenting Program) on parenting (i.e., laxness, overreactivity, and verbosity) and child disruptive behaviors related to parental stress and psychological wellbeing (Zubrick et al., 2005). Again, our results, in combination with intervention findings, suggest that parenting stress may be an important focus of intercession and that it might usefully target low risk populations. Moreover, our model provides the intervention work with a mechanism that explains why parenting stress is such an important target; it serves as a mediator between maltreatment history and current parenting.

Nevertheless, the study has limitations. We examined a single mediator, parenting stress, although cognitive and physiological factors are also related to both early experience and parenting (Gonzalez, Atkinson, & Fleming, 2009). In addition, we did not assess potential moderators. For example, social support and marital relations modulate the association between parenting stress and parenting (Ostberg & Hagekull, 2000; Rodgers, 1998). Furthermore, we examined only a single aspect of parenting, sensitivity. However, other dimensions of parenting, for example, frightened, frightening, and atypical behavior, are also common in high risk samples (Bailey, Moran, Pederson, & Bento, 2007) and are robust predictors of child outcome (Madigan et al., 2006). In addition, we assessed maternal sensitivity at a single time point, although maternal sensitivity is not entirely stable across time (Atkinson et al., 1999). Finally, this study focused on mothers. It would be important to assess whether the findings hold with respect to fathers.

Furthermore, despite its statistical significance, the meditational model explained only 3.3% of the variance in maternal sensitivity. However, the statistical magnitude of an effect does not necessarily correspond to its theoretical and practical import (Abelson, 1995; McCartney & Rosenthal, 2000; Mook, 1983; Prentice & Miller, 1992; Rosenthal & Rubin, 1983; Sechrest & Yealon, 1982). An oft-cited example involves aspirin as a prophylactic against cardiac arrest, universally recommended but with an effect size of r = .03 (Steering Committee of the Physician’s Health Study Research Group, 1988). The link between aspirin and reduced cardiac arrest is important because it applies across a large part of the lifespan, to a significant proportion of the population, with important consequences; the same considerations pertain to relations between maltreatment history, parenting stress and parenting.

In sum, we validated a model suggesting that parenting stress mediates between maltreatment history and parenting. We believe the model has theoretical implications with respect to mechanism and applied implications respecting intervention. We also believe that the model serves as an easily augmentable platform on which to build a more complete representation of the links between maltreatment history and subsequent parenting.

Acknowledgements

The authors acknowledge the many research assistants involved in the project, in particular Emilie Boucher and Monica Tan. The authors acknowledge the significant contributions of Susan Goldberg, a co-principal applicant on a grant supporting this work. Unfortunately, Dr. Goldberg passed away before completion of this study, but she greatly influenced the content of this report.

References