The association between childhood maltreatment and emotion regulation: Two different mechanisms contributing to depression?

Heather A. O'Mahen a,*, Anke Karl a, Nick Moberly a, Gina Fedock b

a University of Exeter, Mood Disorders Centre, Washington Singer Building, Exeter, EX4 4QG UK
b Michigan State University, Department of Social Work, 254 Baker Hall, Michigan State University, East Lansing, MI 48824, USA

ARTICLE INFO

Article history:
Received 25 June 2014
Received in revised form 16 November 2014
Accepted 17 November 2014
Available online 29 November 2014

Keywords:
Emotion regulation
Rumination
Depression
Behavioural activation
Avoidance
Child abuse

ABSTRACT

Background: Childhood maltreatment is an established distal risk factor for later emotional problems, although research suggests this relationship is mediated by proximal factors. However, it is unclear if different forms of childhood maltreatment are related to unique emotion regulation strategies. In this study, we examined whether avoidance and rumination, two emotion regulation strategies strongly associated with depression, were associated with different forms of childhood maltreatment, and whether these strategies, in turn, mediated the relationship between childhood maltreatment and current depressive symptoms.

Methods: Participants were a community sample of pregnant, primarily low-income women, 55 of whom met criteria for Major Depressive Disorder (MDD) and 85 who had elevated levels of depressive symptoms but did not meet criteria for MDD.

Results: Significant rates of childhood maltreatment were reported. Childhood emotional neglect was related to behavioural avoidance, and childhood emotional abuse was related to rumination. In path analyses, behavioural avoidance mediated the relationship between childhood emotional neglect and depression. Rumination was a partial mediator of childhood emotional abuse and depression.

Limitations: The data were correlational in nature, and replication with a larger sample will help validate the model.

Discussion: In a clinical, community-based sample different types of childhood maltreatment are related to unique emotion regulation strategies. Implications for understanding the developmental antecedents of emotion regulation and depression are discussed.

Crown Copyright © 2014 Published by Elsevier B.V. All rights reserved.

1. Introduction

Depression is a common, disabling and recurrent condition, affecting between 10–17% of women in a given year (Kessler et al., 2003), and over 60% of individuals who recover from depression will experience another episode within 5 years (Solomon et al., 2000). Because of the psychological, social and economic costs associated with depression, it is important to develop a better understanding of factors related to depression.

Childhood maltreatment (e.g., emotional, physical, and sexual abuse, and emotional and physical neglect) is a widespread problem, affecting between 3 and 32% of the population (Briere and Elliott, 2003; Brown et al., 1998). It has been consistently linked to an increased risk of depression in adulthood (Agid et al., 1999; Kessler et al., 2001), and is related to an elevated risk of developing recurrent and chronic depression (Nanni et al., 2012). Further, in a meta-analysis, Nanni et al. (2012) found that childhood maltreatment was associated with poor response to treatment for depression.

Researchers have conceptualised childhood maltreatment as a distal risk factor that triggers the development of proximal maladaptive cognitive and behavioural styles that, in turn, leave the individual vulnerable to psychological dysfunction (i.e., depression; Brown et al., 2008). The childhood years are thought to be a critical period for the development of emotion regulation skills (Eisenberg et al., 2010), or processes through which individuals modulate their emotions both consciously and nonconsciously (Bargh and Williams, 2007; Rottenberg and Gross, 2003) so that they can effectively respond to environmental demands (Gross and Muñoz, 1995). The uncontrollable, emotionally painful and unpredictable nature of abusive and neglectful environments create conditions that undermine the child’s development of efficacious behaviours, and may serve to promote ineffective emotion regulation strategies that have a later negative impact on emotional functioning (Briere and Jordan, 2009; Spasojevic and Alloy, 2002; Shields and Cicchetti, 2001). We therefore sought to examine...
the mediating role of emotion regulation strategies in the relationship between women’s reports of childhood maltreatment and their depressive symptoms.

**Emotion Regulation Strategies:** In a recent meta-analysis of six trait emotion regulation strategies (acceptance, avoidance, problem solving, reappraisal, rumination and suppression), associated with psychopathology, Aldao et al. (2010) found that avoidance and rumination had the largest (negative) effect sizes associated with depression. Because we were specifically interested in emotion regulation strategies that were most strongly related to depression, we focused on rumination and avoidance as key mediators of the relationship between childhood maltreatment and adult depression. We hypothesised that, because abuse and neglect present behaviour-specific demands on the child, different forms of maltreatment would be related to unique emotion regulation strategies. We explore the evidence for the hypothesised relationships below.

Behavioural avoidance, defined as behavioural attempts to reduce environmental events that are emotionally punishing, has been widely studied in the depression literature (see Aldao et al., 2010 for a review). However, there has been little research specifically investigating the relationship between childhood maltreatment and behavioural avoidance. This is surprising, as the literature on behavioural avoidance suggests it is particularly likely to occur in environments with low positive reinforcement, and high levels of negative reinforcement and punishment (Manos et al., 2010). These are characteristics endemic to abusive, and in particular, neglectful environments. Classic studies of child maltreatment provide evidence that child maltreatment may be associated with behavioural avoidance. For example, in a series of classic studies, neglected children were typically withdrawn in social interactions with peers (e.g., Erickson et al., 1989; George and Main, 1979), and children who were physically abused were primarily avoidant in their attachment (Belsky, 1997). However, to date we are unaware of any studies that have examined the association between childhood maltreatment and behavioural avoidance as an emotion regulation strategy. We posited that behavioural avoidance would be especially likely to be associated with emotional and physical neglect, because consistent low levels of positive reinforcement would firstly fail to provide the child with learning about approaching and tolerating emotions, and would instead model behavioural withdrawal and avoidance as a mechanism through which to reduce emotional and physiological arousal.

We hypothesised that childhood maltreatment contexts that were marked by the inconsistency, manipulation and uncertainty associated with emotional and sexual abuse would be related to rumination as an emotion regulation strategy. Consistent with other theoretical accounts (Conway et al., 2004; Spasovic and Alloy, 2002), we posited that emotional and sexual abuse create environments where the child may need to adopt a passive style that is also hypervigilant to environmental threats that are outside the child’s control. Such an environment may reduce opportunities for problem-solving, and increase internal focus (Conway et al., 2004). Instead, the developing child may passively focus on attempts to anticipate unpredictable outcomes, balancing the need to prepare for the worst against the alternate possibility of equivocal outcomes (Borkovec, 1994).

Research on depressive rumination, which is defined as a repetitive focus on the causes and consequences of experiences and emotions (Nolen-Hoeksema et al., 2008), broadly supports this hypothesis. A growing body of research has demonstrated that rumination is associated with a history of childhood emotional and sexual abuse Barnhofer et al., (2007)Spasovic and Alloy, 2002). Brooding, the maladaptive component of rumination, has also been identified (Treynor et al., 2003). Brooding is defined as a “passive comparison of one’s current situation with some unachieved standard” and reflection is defined as, “a purposeful turning inward to engage in cognitive problem solving to alleviate one's depressive symptoms” (Treynor et al., 2003, p. 256). There is a considerable body of research linking brooding rumination with the onset and maintenance of depression (see Nolen-Hoeksema et al., 2008 for a review). Raes and Hermans (2008) found that brooding, but not reflection, mediated the relationship between emotional abuse and concurrent depressive symptoms. Thus, brooding may be a particularly useful construct through which to understand and examine the relationship between childhood maltreatment and depression, specifically emotional and sexual abuse and depression.

Lastly, there is growing evidence that rumination is a cognitive form of avoidance that is associated with behavioural avoidance (Eisma et al., 2013; Moulds et al., 2007). Brooding rumination may directly result in behavioural avoidance as an effect of remaining internally focused. Reciprocally, individuals who are attempting to behaviourally avoid uncomfortable contexts and emotions, may instead engage in rumination as a way to appear to be engaged in coping by “trying to solve my problems” (Lyubomirsky et al., 1999). We therefore expected that although rumination and behavioural avoidance would be uniquely correlated with different childhood maltreatment contexts, they would also be correlated with one another.

1.1. The current study

The majority of previous studies of childhood maltreatment have used adolescent and university populations. Many studies also often focus either solely on childhood abuse, or childhood emotional abuse and emotional neglect, without considering all forms of maltreatment together. Although adolescent and university populations represent an excellent opportunity to understand the role of childhood maltreatment during a transitional age period, such studies also often report lower rates of physical and sexual abuse than those described in epidemiological studies (Hussey et al., 2006; Kingston et al., 2013). This may be in part due to the restricted sociodemographic range of the study sample. Further, few of these studies have examined the impact of childhood maltreatment in a clinical sample. These studies may consequently be limited in the extent to which they can fully examine the impact of different types of maltreatment, particularly less frequently occurring forms of maltreatment, on more proximal mechanisms of emotion regulation and emotional distress. In the current study, we drew from an ethnically and socioeconomically diverse group of nondepressed and clinically depressed community women in order to maximise the generalisability of our findings. We also considered both childhood abuse and neglect variables.

1.2. Hypotheses

1. We hypothesised that different forms of childhood maltreatment, a distal vulnerability factor, would be associated with depression via unique proximal emotion regulation strategies. We predicted both childhood neglect and abuse would be related to current depressive symptoms. We expected that neglect, constituting an environment of consistently low levels of reinforcement would be related to behavioural avoidance and that abuse, which is characterised by inconsistency and ambiguity, would be related to brooding, but not reflection. Consistent with previous literature, we hypothesised that reflection would not be related to any of the childhood maltreatment variables.

2. As demonstrated in Fig. 1, we hypothesised that behavioural avoidance would mediate the relationship between childhood neglect and depressive symptoms, and that brooding would mediate the relationship between childhood abuse and current depressive symptoms.
2.2. Measures

Review Board at the University of Michigan Medical Center. A subset of the measures pertinent to the research questions of this study, each scale demonstrated good to excellent internal consistency: emotional abuse $\alpha = .81$, physical abuse $\alpha = .87$, sexual abuse $\alpha = .94$, emotional neglect $\alpha = .76$, physical neglect $\alpha = .71$. The CTQ can also be used to classify individuals into clinical categories of “none/minimal”, “low to moderate”, “moderate to severe”, and “severe to extreme” abuse.

Emotion Regulation Measures: Level of rumination was assessed using the 10-item version of the 22-item Ruminative Responses Scale (RRS; Teynor et al., 2003). Principal components analyses of the 10-item version have revealed two subscales; reflection and brooding. Each subscale has shown good internal, $\alpha = .72$, $\alpha = .77$, and test–retest consistency, $r = .60$, $r = .62$, respectively. The 10-item scale is also nonredundant with the content of measures of depression (Teynor et al., 2003). In this study, the subscales demonstrated good internal consistency: reflection $\alpha = .70$, brooding $\alpha = .79$.

We used the 25-item Behavioural Activation for Depression Scale (BADS; Kanter et al., 2007) to assess behavioural activation over the past week. The BADS has four subscales: Activation, Avoidance/Rumination, Work/School Impairment, and Social Impairment, which have been validated in an undergraduate sample (Kanter et al., 2009). The EPDS was used to screen women for possible depression. In keeping with recommendations, we used of a cut-off of 12 for detecting depression (Hewitt et al., 2009). The EPDS was administered at screening.

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) is a widely used, reliable measure of mood with both general and perinatal populations (e.g., Cuijpers et al., 2010; O’Hara et al., 1984). Continuous scores on the BDI-II were used as the primary outcome measure. The BDI exhibited excellent internal consistency in this study, $\alpha = .87$.

Childhood Trauma: A history of childhood trauma was assessed with the Childhood Trauma Questionnaire (Bernstein et al., 1994). The CTQ is a well-established 28-item self-report screening measure that assesses retrospective childhood maltreatment on 5 domains: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The CTQ has demonstrated excellent reliability, convergent, divergent and predictive validity in both adult community and psychiatric populations (Hussey et al., 2006). In our study, each scale demonstrated good to excellent internal consistency: emotional abuse $\alpha = .81$, physical abuse $\alpha = .87$, sexual abuse $\alpha = .94$, emotional neglect $\alpha = .76$, physical neglect $\alpha = .71$. The CTQ can also be used to classify individuals into clinical categories of “none/minimal”, “low to moderate”, “moderate to severe”, and “severe to extreme” abuse.

Mood: Diagnostic status of Major Depression was assessed with the Structured Clinical Interview for DSM-IV Axis 1 Disorders-Patient Edition (SCID-I, First et al., 1995). The SCID was administered by masters and doctoral level individuals trained in diagnostic assessment and administration of the SCID.

The EPDS (Cox et al., 1987) is a 10-item scale originally designed to screen for depression in postnatal populations and pregnant populations (Adouard, Glangaud-Freudenthal, & Gobe, 2005). The EPDS was used to screen women for possible depression. In keeping with recommendations, we used of a cut-off of 12 for detecting depression (Hewitt et al., 2009). The EPDS was administered at screening.

The Beck Depression Inventory-II (BDI-II; Beck et al., 1996) is a widely used, reliable measure of mood with both general and perinatal populations (e.g., Cuijpers et al., 2010; O’Hara et al., 1984). Continuous scores on the BDI-II were used as the primary outcome measure. The BDI exhibited excellent internal consistency in this study, $\alpha = .87$.

Childhood Trauma: A history of childhood trauma was assessed with the Childhood Trauma Questionnaire (Bernstein et al., 1994). The CTQ is a well-established 28-item self-report screening measure that assesses retrospective childhood maltreatment on 5 domains: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. The CTQ has demonstrated excellent reliability, convergent, divergent and predictive validity in both adult community and psychiatric populations (Hussey et al., 2006). In our study, each scale demonstrated good to excellent internal consistency: emotional abuse $\alpha = .81$, physical abuse $\alpha = .87$, sexual abuse $\alpha = .94$, emotional neglect $\alpha = .76$, physical neglect $\alpha = .71$. The CTQ can also be used to classify individuals into clinical categories of “none/minimal”, “low to moderate”, “moderate to severe”, and “severe to extreme” abuse.

Emotion Regulation Measures: Level of rumination was assessed using the 10-item version of the 22-item Ruminative Responses Scale (RRS; Teynor et al., 2003). Principal components analyses of the 10-item version have revealed two subscales; reflection and brooding. Each subscale has shown good internal, $\alpha = .72$, $\alpha = .77$, and test–retest consistency, $r = .60$, $r = .62$, respectively. The 10-item scale is also nonredundant with the content of measures of depression (Teynor et al., 2003). In this study, the subscales demonstrated good internal consistency: reflection $\alpha = .70$, brooding $\alpha = .79$.

We used the 25-item Behavioural Activation for Depression Scale (BADS; Kanter et al., 2007) to assess behavioural activation over the past week. The BADS has four subscales: Activation, Avoidance/Rumination, Work/School Impairment, and Social Impairment, which have been validated in an undergraduate sample (Kanter et al., 2009).

Fig. 1. Full mediational path model.

(3) Consistent with previous literature highlighting the avoidance function of brooding, we predicted that rumination would be related with greater behavioural avoidance.

2. Method

2.1. Participants and procedure

Participants in this study were 140 pregnant women (number of weeks pregnant: $M=23.27$; $SD=9.23$) who were recruited in obstetrics clinic settings as part of a larger Cognitive Behavioural Therapy (CBT) treatment trial for perinatal depression (O’Mahen et al., 2013). Inclusion criteria were: age 18 or older, 24 or more weeks pregnant, scoring 12 or greater on the Edinburgh Postnatal Depression Screen (EPDS) at screen, and not currently receiving any treatment for depression. Women were excluded if they did not speak English, did not plan to return to the clinic for additional care (e.g., moving out of the area), suffered from an intellectual disability or any psychotic disorder, or met criteria for current alcohol/drug abuse or dependence.

Women were recruited from five obstetrics clinics in Southeastern Michigan. Two of the clinic sites were university hospital affiliated, serving women primarily with private or Medicaid insurance. Three of the clinics were private and part of a nonprofit organisation focused on treating underserved populations in urban settings, serving predominately women with Medicaid. Research assistants approached women in the clinic waiting rooms and asked them to complete the EPDS. Women who met the inclusion criteria were invited to participate in a clinical interview either over the phone or at a location of the woman’s choosing. The clinical interview established whether the participant met criteria for Major Depressive Disorder. Women were also asked to complete a series of measures during the clinical interview, which was conducted over the telephone or in a location of the woman’s choosing (e.g., home, clinic), at a time of her choosing. A subset of the measures pertinent to the research questions of this paper are detailed below.

Ethical approval for the study was given by the Institutional Review Board at the University of Michigan Medical Center.

2.2. Measures

Mood: Diagnostic status of Major Depression was assessed with the Structured Clinical Interview for DSM-IV Axis 1 Disorders-Patient Edition (SCID-I, First et al., 1995). The SCID was administered by
et al., 2007) and a community sample with elevated depressive mood (Kanter et al., 2009). The BADS has good test–retest reliability (r = .74). The Work/School Impairment and Social Impairment scales assess avoidance that negatively impacts these domains. Because the Avoidance/Rumination subscale contained items that both dealt primarily with cognitive avoidance and overlapped with the content in the Rumination Responses Scale, we summed items from the Activation, Work/School Impairment and Social Impairment subscales to form a total behaviour activation score (α = .71). Higher scores on the scale are indicative of more behavioural activation and less behavioural avoidance.

2.3. Statistical analysis

To test hypotheses assessing basic relationships between variables, we computed Pearson correlations between the predictor and outcome variables. We investigated hypotheses about which childhood maltreatment variables were related to BA and brooding in two separate multiple regressions, with BA and brooding as the criterion variables, respectively. We tested mediational hypotheses using nested path models in AMOS 18 (Arbuckle, 2007). Nested path models are advantageous in that (a) all variables of interest in the model can be simultaneously calculated, and (b) similar models can be compared against each other, allowing the researcher to determine a “best fit” model. Following Baron and Kenny’s (1986) recommendations for mediation, we only included variables in the path model if they were (a) an independent variable (IV: childhood maltreatment variable) that was both significantly related to the dependent variable (DV: depressive symptoms) and mediator (emotion regulation variable), and (b) if the mediator was significantly correlated with the DV. Mediation was assessed using bootstrapping procedures (Shrout and Bolger, 2002). In regression analyses, missing data were handled using listwise deletion. In path analyses in AMOS, missing data were handled using maximum likelihood estimation.

3. Results

3.1. Participant characteristics and levels of abuse experienced

Table 1 describes the sample demographics. Of the 2382 women who were approached for screening, 961 (40%) declined to participate. A further 1220 (51%) did not have an EPDS score ≥ 12. Of the 201 women who were eligible for the interview, 49 (24%) could not be contacted, or declined to participate in the interview. An additional 12 participants (6%) were not included in the interviews for other reasons, including being taken on as pilot “practice” patients, refusing trial participation, or not being able to complete the interview (e.g., due to interruptions during the interview). Of the 140 participants, 55 women met criteria for current major depression, 85 did not meet criteria for depression. Women were broadly representative of the demographic areas in which recruitment occurred, 40.3% were living below the poverty line, as defined by the US Census Bureau (2010), and 51% were of minority status; 38% were African American.

Frequency analyses indicated a notable number of women endorsed having experienced moderate to greater levels of emotional, physical, and sexual abuse, with a significant minority of women reporting severe to extreme levels of abuse (see Table 2). One in five women endorsed moderate or greater levels of emotional neglect, and physical neglect was also reported by a significant minority of women.

There were no significant differences in income status, χ² (1) = .252, p = .61, education, χ² (1) = 4.45, p = .03, age, t (147) = .58, p = .56, and relationship status, χ² (1) = 1.435, p = .84 between the depressed and nondepressed groups of women. White women (n = 36, 50.7%) were more likely to meet criteria for depression than Black women, (n = 19, 31.3%), χ² (1) = 5.16, p = .023.

3.2. Zero order correlations

Table 3 presents the correlations among the key variables. Depressive symptoms were significantly correlated with emotional, physical and sexual abuse and emotional neglect, but not with physical neglect. As predicted, brooding and reflection were positively correlated with depressive symptoms, and BA was negatively correlated with depressive symptoms. Brooding and BA were inversely related, but, as hypothesised, reflection was not correlated with BA. Emotional, physical, and sexual abuse and emotional neglect were all positively correlated with brooding. Physical neglect was not significantly correlated with brooding. Reflection was not correlated with any of the outcome variables.
the childhood abuse variables. As a consequence, reflection was not included in subsequent analyses. Behavioural activation was inversely correlated with emotional and sexual abuse, and with emotional and physical neglect, but was not significantly correlated with physical abuse.

3.3. What childhood maltreatment factors are associated with brooding and BA?

We ran two separate multiple regressions to examine which maltreatment (child abuse and neglect) factors, when considered simultaneously, predicted either brooding (but not reflection), or BA. In each regression, we entered each of the maltreatment factors. SPSS diagnostics were also examined to ensure that the regression models were not biased due to multicollinearity (Diagnosti
cations indicated that all VIF < 10, all tolerance statistic > .2). All other assumptions of regression were met. The distribution of the residuals within this high risk, community sample was normally distributed, and the relationship between the predictor and outcome variables was linear and met the prerequisite for homoscedasticity.

In the first regression model, we entered the abuse and neglect variables as predictors of brooding (see Table 4). The overall model was significant, $F(5, 126)$ = 4.37, $p < .001$. Of the five maltreatment factors considered in the model, emotional abuse was the only variable that predicted unique variance in brooding, $\beta(1) = .404$, $p = .005$. Greater childhood emotional abuse was related to greater brooding.

A second regression was calculated with BA as the criterion variable (see Table 4). The overall model was significant, $F(5, 126)$ = 2.57, $p = .03$. Of the five predictors, emotional neglect was the only variable that predicted unique variance in BA, $\beta(1) = -.257$, $p = .036$.

Greater emotional neglect was associated with more activation (less avoidance).

3.4. Structural model for testing mediated variables

We tested five nested structural models that examined the mediational model proposed in Fig. 1. We based our model on both theory and the empirical findings from the regression results. As such, we hypothesised that there would be two unique pathways to depressive symptoms; a path from emotional abuse to depressive symptoms that was mediated by brooding, and a second path from emotional neglect to depressive symptoms that was mediated by behavioural activation. We also tested the hypothesis that brooding would be related to less behavioural activation. We tested the overall goodness of fit following Hu and Bentler’s (1999) suggestions. We used four indices to assess goodness of fit for the models: the root-mean-square error of approximation (RMSEA; values of .06 or less indicate an adequate fit), the standardized root-mean-square residual (SRMR; values of .08 or less indicate an adequate fit), the Comparative Fit Index (CFI), which should be equal to or greater than .90, and the relative chi-square, CMIN/df (CMIN/df; values less than 3 indicate an adequate fit) (Fan et al., 1999).

Table 5 shows the results of the nested path models. Each of the figures for the first four models are presented in Fig. 2, Fig. 2 presents the final, the fifth model. Model 1 tested a full mediational model of both brooding and BA. Because there was also a significant zero order correlation between emotional neglect and brooding, we allowed this path to be estimated. The results demonstrated that the model was a poor fit with the data. As the path between emotional neglect and brooding had a low correlation, ($r = .07$), in Model 2 we constrained this pathway to zero. The comparison of Model 1 and Model 2 revealed that there was no significant improvement in Model 2. We therefore allowed this pathway to vary in future models. Guided by previous literature, which has demonstrated that brooding partially, but not fully, mediates the relationship between emotional abuse and depressive symptoms, in Model 3 we added a direct path between these two variables. Comparison of Model 3 with Model 1 revealed that Model 3 provided a better, but still not adequate, fit to the data. In Model 4 we tested whether BA also partially, rather than fully, mediated the relationship between emotional neglect and depression symptoms. This model did not converge. In Model 5 we tested whether the relationship between brooding and BA was reciprocal, rather than unidirectional from brooding to BA. This model was a good fit with the data and improved on the previous models. The path coefficients for Model 5 are shown in Fig. 2.

---

**Table 3**

Correlations between variables.

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BDI-II</td>
<td>.590</td>
<td>.255</td>
<td>-.565</td>
<td>.354</td>
<td>.196</td>
<td>.234</td>
<td>.185</td>
<td>.165</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.003</td>
<td>.000</td>
<td>.000</td>
<td>.025</td>
<td>.007</td>
<td>.034</td>
<td>.059</td>
<td></td>
</tr>
<tr>
<td>2. Rumination brooding</td>
<td>.463</td>
<td>-.294</td>
<td>.358</td>
<td>.225</td>
<td>.242</td>
<td>.200</td>
<td>.149</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.001</td>
<td>.000</td>
<td>.010</td>
<td>.005</td>
<td>.022</td>
<td>.089</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Reflection</td>
<td>-.045</td>
<td>.164</td>
<td>.057</td>
<td>-.041</td>
<td>.037</td>
<td>.055</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.611</td>
<td>.060</td>
<td>.516</td>
<td>.248</td>
<td>.070</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Behavioural activation (less avoidance)</td>
<td>-.158</td>
<td>-.057</td>
<td>-.189</td>
<td>-.268</td>
<td>-.186</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.070</td>
<td>.516</td>
<td>.030</td>
<td>.002</td>
<td>.032</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CTQ emotional abuse</td>
<td>.665</td>
<td>.365</td>
<td>.658</td>
<td>.308</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CTQ physical abuse</td>
<td>.284</td>
<td>.066</td>
<td>.028</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.001</td>
<td>.000</td>
<td>.028</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. CTQ sexual abuse</td>
<td>.293</td>
<td>.238</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.001</td>
<td>.006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. CTQ emotional neglect</td>
<td>.572</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1 We also ran One-Way ANOVAs assessing the relationship between diagnostic depression status, as determined by the SCID, and the abuse and emotion regulation variables. Mirroring the results using BDI-II as a dimensional outcome, greater emotional abuse, sexual abuse, and emotional neglect were all significantly related to having a depression diagnosis: $F(1,131) = 16.41$, $p < .000$, $F(1,131) = 10.48$, $p = .002$, $F(1,131) = 8.36$, $p = .005$ respectively. Behavioural avoidance and rumination were also significantly related to having a depression diagnosis: $F(1,134) = 42.14$, $p < .001$; $F(1,134) = 15.59$, $p < .001$, respectively. Logistic regression assessing the mediating effects of BA and rumination revealed that BA, $R(1,06, p < .001$, odds ratio = 1.07 (95% CI 1.03, 1.10) but not rumination, $R(1) = -.00$, $p = .37$, odds ratio = -.67 (95% CI 0.38, 1.19) completely mediated the relationship between emotional neglect and depression status $R(1) = -.03$, $p = .62$, odds ratio = 1.03 (95% CI 0.91, 1.16) and partially mediated the relationship between emotional abuse and depression status $R(1) = -.151$, $p = .03$, odds ratio = .86 (95% CI 0.75, 0.98).
3.5. Testing the significance of indirect effects

We tested the significance of the indirect effects between emotional abuse, brooding and depressive symptoms and emotional neglect, BA and depressive symptoms in Model 5. Consistent with Shrout and Bolger’s (2002) recommendations, we formed 1000 bootstrap samples from the original data set using random sampling with replacement. We used AMOS 18 to re-estimate the path coefficients of Model C 1000 times. The estimates of each path coefficient were then used to calculate mean indirect effects across the 1000 samples, together with the estimates of standard errors for the distribution of these coefficients. The results demonstrated that there was a full mediation of BA (higher levels of avoidance/less approach) on the relationship between emotional neglect and depressive symptoms, $\beta = .23$ (95% CI [0.10 to 0.38]), and a significant partial mediation of brooding on the relationship between emotional abuse and depressive symptoms, $\beta = .26$ (95% CI [0.14 to 0.42]) of abuse were not statistically significantly related to depressive symptoms. However, we note that the size of the correlations were similar to those of the other correlations, suggesting a small to moderate relationship with depressive symptoms.

We also found that all forms of childhood abuse were positively correlated with brooding, but reflection was not correlated with any of the maltreatment factors. Although these results are consistent with the literature on reflection (Raes and Hermans, 2008; Treynor et al., 2003), they are in contrast to previous research which has not found a relationship between physical abuse and brooding (Spasojevic and Alloy, 2002). The higher prevalence of physical abuse in our sample may explain these results in part. However, when simultaneously investigating childhood maltreatment predictors of brooding, only emotional abuse, defined as a pervasive, psychologically harmful relationship between the carer and child (Glaser, 2002) emerged as a significant predictor of brooding.

Consistent with our hypothesis that BA would be especially likely to be related to environments that were consistently low in reinforcement, in this study BA was correlated with emotional and physical neglect and sexual abuse. It is interesting to note that, in contrast with previous literature that has found emotional abuse to be robustly related to both a range of emotion regulation strategies (e.g., cognitive) and psychological distress (Merrill et al., 2001; Runtz and Schallow, 1997), neither emotional nor physical abuse was significantly correlated with BA in this study, although the size of the correlation between emotional abuse and BA was similar to the size of the other correlations. This is also in contrast to other research that has found that emotional abuse is correlated with experiential avoidance, a concept that includes BA (Barnhofer et al., 2014). When considered simultaneously with other forms of maltreatment, only emotional neglect, defined as a pattern of child–caregiver interactions characterised by emotional unavailability, unresponsiveness, and neglect (Glaser, 2002) emerged as a significant predictor of BA.

Although further research is needed to determine the specific contextual and process-related factors underlying the relationship of emotional neglect to behavioural avoidance, and emotional abuse to rumination, research in attachment provides a potential organising theoretical structure. Children with caregivers who are consistently emotionally unavailable are at greater risk for developing an avoidant attachment style, which is characterised by a lack of responsiveness to and involvement with the primary caregivers (Pauli-Pott and Mertensacker, 2009). The results from the current study suggest that childhood emotional neglect may likewise result in a generalised pattern of passive behavioural avoidance, which places the individual at risk for low levels of positive reinforcement that may be subsequently related to depressive symptoms (Martell et al., 2001). In contrast, children who are subjected to emotional abuse receive input from their carers, although this input is characterised by inconsistency and uncontrollability; a style of input consistent with anxious attachment. In a recent study, rejection sensitivity, an interpersonal style associated with anxious attachment, prospectively predicted rumination (Pearson et al., 2011). Thus, it may be that the attachment styles that emerge from different patterns of abuse and neglect lead to distinctive emotion regulation strategies.
When all forms of abuse and neglect were considered together, only the emotional aspects of abuse and neglect were significantly correlated with brooding rumination, behavioural activation (more avoidance) and depressive symptoms. Other studies of psychiatric and community samples of depressed individuals who have experienced child maltreatment literature have found similar results (Barnhofer et al., 2014; Gibb et al., 2007; Gross and Keller, 1992).

Given that emotional abuse occurs in 90% of cases where the child is also physically or sexually abused, and often precedes and persists beyond physical forms of abuse, it may be that the lasting psychological impact of different forms of abuse is largely explained by the emotional abuse patterns common across all forms of abuse. Rose and Abrahamson (1992) hypothesize that emotional abuse has a specific role in the development of depression because the abuser(s),

---

**Fig. 2.** Models 1 through 5.
over time, provide the individual with content that may develop into negative cognitions that subsequently place the individual at risk for depression. Although we did not directly assess negative cognitions in this study, other correlational and longitudinal studies have found some initial support for this hypothesis (Gibb and Alloy, 2006; Gibb et al., 2001). However, the results from our study suggest that emotional abuse is not only related to the content of an individual’s thoughts, but also to the repetitive, ruminative nature in which that person focuses on negative thoughts. Further, these results provide novel evidence for the role of emotional neglect in depression, as it is related to behavioural activation. Although these results provide support for the role of the emotional aspects of childhood maltreatment on depression, we also recognise that the results may be partly due to the way in which the CTQ measures sexual and physical abuse, assessing frequency, rather than severity, of abuse (Gratz et al. 2007).

The results on BA also provide support for the idea that avoidance is a multifaceted concept consisting of cognitive, emotional and behavioural avoidance. Although there is a growing body of research on experiential avoidance, we suggest that the results from the current study indicate that it may be useful in future research to explicate different components of experiential avoidance as they may be related to different contextual and childhood developmental factors.

Lastly, in this study there was a moderate and significant correlation between BA and brooding. In our overall model, we also found that behavioural activation (greater avoidance) and rumination were reciprocally related, suggesting that although different forms of childhood maltreatment may be uniquely related to different emotion regulation strategies, these strategies, once developed, may serve a self-perpetuating function. These findings are consistent with previous literature has suggested that rumination and avoidance may be separate, but related, processes (Moulds et al., 2007). For example, individuals may engage in rumination as a way to avoid uncomfortable situations, or circumstances that they perceive to have low reward (Warinck, 2009). Thus, commensurate with evidence that brooding may be a cognitive avoidance strategy that also contributes to behavioural avoidance, the lack of reinforcement and concrete information procured when behaviourally active may contribute to ongoing brooding. These results suggest that clinically it is important to assess the emotional aspects of both abuse and neglect, and that clinicians may consider the relationship between these experiences and current emotion regulation strategies. Clinicians may choose to directly target emotion regulation strategies related to specific maltreatment experiences, with the understanding that addressing one may also positively impact on the other.

Limitations: Several limitations in the current study should be noted. Firstly, the study assessments were concurrent, and reports of childhood maltreatment were retrospective. The retrospective nature of childhood maltreatment reports may exaggerate the strength of relationships, and be influenced by the present emotional states of individuals. Experimental and longitudinal research is needed to further explicate the relationships between the assessed variables. We also used self-report measures of childhood maltreatment, rumination and behavioural. Although the childhood maltreatment measure has high concurrent validity with interview measures, it does not assess length or severity of the abuse, or the relationship of the perpetrator, key factors in prospective studies that are associated with the later impact of abuse (for a review see Tyler, 2002).

The sample in this study consisted of pregnant women who had elevated depressive symptoms and were also willing to consider entry into a study for the treatment of depression. As such, the findings may be limited in generalisability. Participants in this study may make particular use of the emotion regulation strategies we examined. However, we note that the sample was broadly representative of women in the areas in which we recruited in terms of sociodemographics. Further we also note that the rates of both depressive symptoms and childhood maltreatment in this sample were representative of community samples of lower income earning women. Findings from this sample, although potentially limited to higher-risk, lower-income groups, add to the existing child maltreatment literature, which is currently dominated by samples of middle class University students.

Although overall we found largely acceptable model fit in Model 5, our best fitting model, across several different fit indices (CFI, CMIN/DF, SRMR, and $\chi^2$), the RMSEA value with this model was indicative of moderate fit. This may be, in part, due to the number of individuals who participated in this study (Chen et al., 2008). Further research with larger samples may provide further validation for the model. Lastly, this research was conducted solely with women. It is important to also investigate these processes in mixed gender samples.

4.1. Conclusions

These findings suggest that different types of childhood caregiver–child interactions are related to different pathways associated with depression, and these pathways may be determined, in part, by different emotion regulation strategies. Key strengths of this study include use of a racially and economically diverse community sample, assessing a broad range of child maltreatment factors, and interview-based clinical diagnosis of depression. Although this study looked at current depressive symptoms, other studies have demonstrated that childhood maltreatment is associated with more severe, chronic, and recurring forms of depression. This study is a first step towards understanding the ways in which different forms of childhood maltreatment are associated with different emotion regulation strategies. This knowledge may help to inform efforts to target specific processes during treatment in an effort to improve treatment effects and reduce relapse, particularly in individuals suffering from chronic or recurring depression.

5. Role of funding source

This research was funded by NIMH 5R34MH076219, awarded to Heather Flynn.

Acknowledgements

We thank Drs. Jessica Wright and Steven R. H. Beach for their input as consultants on this study. We would also like to thank all the women who participated in the research and the participating clinics and staff for their assistance with the research.

References


