CAREGIVER’S HISTORY OF DEPRESSIVE SYMPTOMS AND CHILD AFFECT EXPRESSION IN THE CONTEXT OF STRUCTURED INTERACTION TASKS

by

Julia B. Vahlsing

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Master of Arts in Psychology

Fall 2009

Copyright 2009 Julia B. Vahlsing
All Rights Reserved
CAREGIVER’S HISTORY OF DEPRESSIVE SYMPTOMS AND CHILD AFFECT EXPRESSION IN THE CONTEXT OF STRUCTURED INTERACTION TASKS

by

Julia B. Vahlsing

Approved: ____________________________________________

Adele M. Hayes, Ph.D.
Thesis Advisor

Approved: ____________________________________________

Thomas M. DiLorenzo, Ph.D.
Chair of the Department of Psychology

Approved: ____________________________________________

George Watson, Ph.D.
Interim Dean of the College of Arts and Sciences

Approved: ____________________________________________

Debra Hess Norris, M.S.
Vice Provost for Graduate and Professional Education
ACKNOWLEDGMENTS

My advisor, Adele Hayes, and my colleague Jorden Cummings, for their guidance academic support, and assistance with preparation of this manuscript.

The staff of the Early Learning Center and all of the families who have given their time to make this research possible.

My family for their unconditional support.
TABLE OF CONTENTS

LIST OF TABLES ........................................................................................................... vi
LIST OF FIGURES ........................................................................................................ vii
ABSTRACT .................................................................................................................... viii

Chapter
1 INTRODUCTION .................................................................................................. 1
   The Current Study ................................................................................................. 10
2 METHOD .............................................................................................................. 12
   Participants ........................................................................................................... 12
   Measures .............................................................................................................. 13
   Interaction Tasks .................................................................................................. 15
      Activation of positive affect system ................................................................. 17
      Activation of negative affect system ............................................................... 17
   Procedure ............................................................................................................. 19
      Experimenter-child interactions ..................................................................... 20
      Caregiver-child interactions ......................................................................... 20
   Observational Coding ......................................................................................... 23
3 RESULTS ............................................................................................................. 28
   Manipulation Check ............................................................................................ 29
   Caregiver depression, experiential avoidance, and caregiver responses to
caregiver-child interactions .................................................................................. 29
   Caregiver depression, experiential avoidance, and child responses to
interaction tasks ..................................................................................................... 30
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>DISCUSSION</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Limitations</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>45</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1  Means, standard deviations, and intercorrelations of caregiver depression, experiential avoidance, and caregiver and child affect expression and behavior .......................................................... 32

Table 2  Intercorrelations of caregiver depression, experiential avoidance, and caregiver and child affect expression, controlling for child’s gender ......................................................................................................................... 34
LIST OF FIGURES

Figure 1  Design of Present Study................................................................. 27
ABSTRACT

Reduced positive emotionality (PE) in children of depressed mothers has been identified as a risk factor for later depression. In the current study we explored the associations between maternal history of depression, avoidance of emotions (experiential avoidance, EA), and sensitivity to child expression of affect in response to interactive tasks designed to elicit positive and negative affect. Participants were 32 caregivers and their preschool-aged children enrolled in a daycare center. Children interacted with both caregivers and experimenters. Caregiver’s history of depression and EA were associated with lower positive affect and sensitivity to child’s emotions respectively. In contrast to findings of low PE in children of depressed mothers, higher caregiver past depression scores were associated with the expression of more positive affect (interest/engagement/excitement) in their children and a tendency to express less negative internalizing affect. These findings were specific to interactions with the caregiver. This pattern of avoidance of emotion, decreased sensitivity to child affective expressions, and more positive and less negative child affect suggest a possible link between maternal depression and child emotion regulation.
Chapter 1

INTRODUCTION

Depression is currently one of the leading causes of disease-related disability worldwide, and it is predicted that by 2020 it will produce more disease burden than any other illness (Murray & Lopez, 1997). Approximately one in five people in the United States will develop depression at some point during their life (Kessler, et al., 1994). Research indicates that at least 50% of patients who recover from their first episode of depression will have one or more subsequent episodes over their lifetime (Paykel et al., 1995). Each additional episode of depression increases the risk for a subsequent episode, the severity of episodes, the likelihood that episodes will occur without a triggering psychosocial event, and decreases response to previously effective treatment (Kendler, Thornton, & Gardner, 2000; Post et al., 1996).

Furthermore, children with depressed parents are three to four times more likely to develop a mood or anxiety disorder as compared to those with nondepressed parents (Beardslee, Bemporand, Keller, & Klerman, 1983; Lieb, Isensee, Hogler, Pfister, & Wittchen, 2002; Pilowsky et al., 2008; Weissman et al., 2005; Weissman et al., 2006; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997; Warner, Wickramaratne, & Weissman, 2008). Understanding how to prevent initial episodes of depression in children of depressed parents could have a significant impact on the debilitating and often chronic course of depression.
Several early risk factors have been identified for later diagnoses of depression in children (Hankin, 2006). Some risk factors are physiological and difficult to change, such as being female (Clarke et al., 2001) or having a genetic predisposition (Caspi et al., 2003; Rice, Harold, & Thapar, 2002). Psychosocial risk factors are more malleable and can be targeted in prevention or early intervention efforts. Among these risk factors are environmental context, such as exposure to early familial adversity and loss (Beck, 2008; Harkness, Lumley, & Truss, 2008; Meyer, Chrousos, & Gold, 2001; Monroe & Simons, 1991). Cognitive vulnerabilities, such as negative attributional style (Abramson, Metalsky, & Alloy, 1989) and self-criticism (Blatt & Zuroff, 1992), as well as temperament variables (Compas, Connor-Smith, & Jaser, 2004; Watson, Clark, & Harkness, 1994) can further increase risk. Interpersonal vulnerabilities, such as excessive reassurance seeking (Joiner, Katz, & Lew, 1999) or dependency (Blatt & Zuroff, 1992), are also important in the etiology and maintenance of depression.

One risk factor that influences several of these environmental, cognitive, and interpersonal risk factors is maternal depression. Research indicates that having a parent with depression is a strong predictor of depression in children (Beardslee, Versage, & Gladstone, 1998; Coyne & Downey, 1991). Parents influence children’s genetic risk, their experiences in the world, and can shape their patterns of behavior and thought. Weissman et al. (2006) found that children of depressed parents were at three times greater risk for developing anxiety disorders, depression, and substance use disorders in adulthood than children with nondepressed parents. Using this same sample of children, Weissmann et al. (2005) found a moderating effect of
grandparental depression on the association between parental depression and child
diagnoses of psychological disorders. Pettit, Olino, Roberts, Seeley, and Lewinsohn
(2008) also found evidence for intergenerational transmission of depression across
three generations. Their research indicated that children’s parent-reported depression
or anxiety symptoms were predicted by the parent’s depression history and, in turn, the
parent’s depression was predicted by the grandparent’s depression history.
Interestingly, Hammen, Shih, and Brennan (2004) found similar relationships with
mothers and grandmothers specifically. Grandmothers’ depression history predicted
grandchild’s’ anxiety and depression symptoms, and interpersonal stress and
functioning of the mother and/or grandmother mediated the relationship between their
depression and depression in the child (third generation).

The link between maternal depression, child depression and other
psychological symptoms in offspring is clear, but the mechanisms of this
intergenerational transmission are less clear. Depression is characterized by sadness or
irritability, loss of interest, fatigue, and at times thoughts of suicide (American
Psychiatric Association, 2000), all of which can reduce the quality of parenting, one
possible factor that can contribute to risk. Research indicates that maternal depression
is associated with more hostile parenting style and disengagement (Lovejoy Graczyk,
O’Hare, & Neuman, 2000), greater criticism and hostility (Frye & Garber, 2005;
Webster-Stratton & Hammond, 1988), and less responsive parenting practices
(Goodman, 2007).

Inadequate parenting in depressed parents has been hypothesized to
negatively affect a child’s social and cognitive development because the mother is
unable to meet the child’s social and emotional needs (Cicchetti & Toth, 1998). Inadequate parenting can also be conceptualized as a life stressor to the child (Caldji, Diorio, & Meaney, 2000; Newport, Stowe, & Nemeroff, 2002; Sanchez, Ladd, & Plotsky, 2001). In addition, children can model cognitions, emotion regulation styles, and behaviors they observe in the depressed parent (Goodman, 2007). Depressed mothers have more negative views of themselves as parents (Gelfand & Teti, 1990; Goodman, Sewell, Cooley, & Leavitt, 1993), less confidence in their ability to positively shape their children (Kochanska, Radke-Yarrow, Kuczynski, & Friedman, 1987), and have more pessimistic and critical perceptions of themselves and their children (Goodman, Adamson, Riniti, & Cole, 1994) compared to nondepressed mothers.

Depression has been linked primarily to dysregulation of the negative affect system, but evidence suggests that lower levels of positive emotionality (PE) may be more characteristic of depression than elevated levels of negative emotionality (NE; Watson, 2000). Positive emotionality is an overall tendency to experience positive moods, be engaged with one’s surrounding, and seek out interactions with others (Watson & Clark, 1997). Low PE has been identified as a risk factor for later depression in preschool-aged children beyond the mother’s present or past depressive symptoms. For instance, PE measured in structured interaction tasks that elicit positive emotions predicted more depressotypic cognitive styles in 3-year-old children assessed again four years later (Hayden, Klein, Durbin, & Olino, 2006). Cognitive style was measured in laboratory tasks designed to elicit helplessness in both cognitive and interpersonal domains and also a self-referent encoding task given after a sad mood
induction. PE at age 3 predicted greater levels of helplessness four years later during the interpersonal helplessness task, but not the cognitive task, indicating that PE may be a better indicator of social rather than cognitive distress. PE at age 3 also predicted decreased recall of positive self-referent words, but did not predict recall of negative self-referent words. This study indicates that the dangerous path to depression can begin as early as 3 years of age and that dysregulation of the positive affect system might be an early marker of risk.

PE has also been found to be predictive of later EEG asymmetry in preschool-aged children beyond the mother’s present or past depressive symptoms. Shankman et al. (2005) reported that lower levels of PE assessed by several structured tasks at age three predicted greater EEG asymmetry in children at five or six years of age. The particular pattern of asymmetry found in these children, (less relative activity in the right frontal area than in the left) has also been reported in adults who are currently depressed (Gotlib, Ranganath, & Rosenfeld, 1998; Henriques & Davidson, 1991), adults who have a history of depression but no current symptoms (Gotlib et al., 1998; Henriques & Davidson, 1991), and in children of depressed parents (Dawson, Frey, Panagiotides, Osterling, & Hossel, 1997; Field, Fox, Pickens, & Nawrocki, 1995). This body of research indicates that this pattern of EEG asymmetry is a robust risk factor for depression, and the connection between childhood PE and later EEG asymmetry shown by Shankman et al. (2005) suggests that childhood PE may be a risk factor as well.

Another potential risk factor of interest is emotion regulation (ER), which is considered a fundamental component of child mental health (e.g., Cole, Martin,
Dennis, 2004; Cole, Teti, & Zahn-Waxler, 2003; Izard et al., 2008). ER, measured by observed reaction during a structured delay of gratification task, has been shown to be associated with internalizing disorders in children (Silk, Shaw, Forbes, Lane, & Kovacs, 2006). Children were observed as they waited for a desired outcome (cookie or toy, depending on age of child) and their coping strategies and overall behaviors were coded. This study also revealed that positive reward anticipation moderated the association between maternal depression and internalizing problems, suggesting that the capacity to experience positive affect may be a protective factor for children at risk for depression. Silk, Shaw, Skuban, Oland, and Kovacs (2006) also demonstrated that preschool-aged children whose mothers had a history of depression were more likely to use passive methods of emotion regulation during a delay of gratification task. In contrast, children of nondepressed mothers used more active strategies during the delay task, such as distracting themselves from the delay by redirecting focus to another area. Passive strategies of emotion regulation have been found to be ineffective in reducing negative emotions (Garber, Braafladt, & Zeman, 1991; Garber, Braafladt, & Weiss, 1995; Silk, Steinberg, & Morris, 2003). Early problems in emotion regulation can place children of depressed mothers at a marked disadvantage for future psychopathology.

Preschool-aged children have been found to develop ER more quickly and consistently when their mothers endorsed fewer symptoms of depression, even after controlling for hostility and punitiveness directed at the child during interactions (Blandon, Calkins, Keane, & O’Brien, 2008). These results indicate that maternal depression may interfere with ER development. Interestingly, low levels of child
physiological reactivity during a structured sustained attention task interacted with mother’s reported depressive symptoms reducing the negative effects of maternal depression on child emotion regulation skills. Those children with more physiological reactivity were more influenced by the mother’s depression resulting in slower ER development.

Experiential avoidance (EA) is a component of ER that has been associated with depression. EA is the tendency to use various strategies, behaviors, and skills to prevent exposure to disturbing emotions, bodily sensations, or memories (Hayes, Wilson, Gifford, Gollette, & Strosahl, 1996). While EA can be beneficial at first by decreasing distress, it ultimately becomes maladaptive, producing a paradoxical effect of increasing distress when the avoided material returns to consciousness. Barlow, Allen, and Choate (2004) have theorized that anxiety and mood disorders are related to attempts to avoid overwhelming emotions or EA. Several studies have found depression and depressive symptoms to be associated with EA (Leahy, 2002; Rottenberg, Kasch, Gross, & Gotlib, 2002; Tull & Gratz, 2008). Research also indicates that young children model mimic their mother’s emotional responses to new objects and will avoid objects when mothers express fear or disgust (Gerull & Rapee, 2002). If a child’s mother is depressed and avoids emotions, it is likely that the child may model that response as well.

Maternal sensitivity and the tone of mother-child interactions have also been found to be predictive of child outcomes. Maternal sensitivity is the mother’s ability to observe and understand her child’s communications and respond to them accurately and quickly (Ainsworth, Bell, & Stayton, 1974). Lower levels of parental
warmth as reported by children have been found to be associated with more child internalizing and externalizing behaviors reported by depressed mothers (McKee et al., 2008). More supportive parental responsivity increases the likelihood that children will learn to regulate and express emotions adaptively and have better peer and academic outcomes (Gottman, Katz, & Hoover, 1997). Maternal sensitivity also has been found to moderate the relationship between maternal depression and other child outcomes, such as cognitive-linguistic functioning, cooperation, and problematic behaviors (NICHD Early Child Care Research Network, 1999).

While research on the intergenerational transmission of depression has accumulated over the last ten years, there are some limitations to the current literature, and mechanisms associated with the transmission are just beginning to be investigated. Several of these limitations are related to the methods assessing the constructs in question. For instance, child outcomes are frequently assessed using the Child Behavior Checklist (CBCL; Achenbach, Edelbrock, & Howell, 1987), based on teacher- and parent-reported measures of children’s problem behaviors. The CBCL can be completed by a teacher, more likely to be less biased, but most studies have relied primarily on the mother’s report of child behavior (McKee et al., 2008; Silk, Shaw, Forbes, et al., 2006; NICHD, 1999). Self-report measures are quick and relatively easy to administer, but they do not necessarily yield accurate measurement and information. Depressed parents appear to be overly sensitive to negative behaviors in their children, which can contribute to inaccurate assessment (Najman et al., 2000; Richters, 1992; Youngstrom, Izard, & Ackerman, 1999). Additional reporters or observational
methods are necessary for more accurate and better understanding of child behavior (McLeod, Weisz, & Wood, 2007).

Parenting behaviors and child behaviors have also been assessed using home observations of parent-child interactions (Durbin, Klein, Hayden, Buckley, & Moerk, 2005; Hayden, et al., 2006). This paradigm has similar limitations to free play tasks in that it is uncertain that negative emotions will be elicited during the interaction, thus limiting the range of emotions and behaviors available to be assessed.

The Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1999) has been used extensively in research on the connections between maternal depression and adverse child outcomes. The Lab-TAB is a series of structured tasks designed to elicit a broad range of emotions and temperamental traits. Different versions have been created for infants and preschoolers. It has been found to be relatively stable, with traits ranging from moderate to high stability from ages three to seven (Durbin, Hayden, Klein, & Olino, 2007). Although the Lab-TAB and parent report were equally good at predicting disruptive behavior in children based on the measurement of anger, the Lab-TAB measurement of PE had stronger associations with maternal depression than parent reports of child temperament (Hayden, Klein, & Durbin, 2005). The Lab-TAB has been used in maternal depression research to measure PE, NE, and behavioral inhibition (BI) in children (Durbin et al., 2005; Hayden et al., 2005; Hayden, et al., 2006; Shankman, et al., 2005). In addition, it has been used in research linking PE to EEG asymmetry (Shankman et al., 2006) and depressotypic cognitive style (Hayden et al., 2006).
The Lab-TAB is a promising procedure to elicit child affective responses and behaviors associated with temperament. It can also be used to examine more specifically the expression of affect in children rather than the larger construct of temperament, which also includes sociability and more trait-like variables. The Lab-TAB has been used for child interactions with experimenters, but also can be used to investigate child and caregiver interactions.

**The Current Study**

In the current study, we used the Lab-TAB to investigate how caregivers with more current and past symptoms of depression interacted with their preschool-aged children when positive and negative affect was activated. The focus was on affective responses in a specific task rather than on the broader construct of child temperament. A measure of caregiver experiential avoidance was included to examine the relationship between maternal beliefs about emotion and her emotion regulation strategies and the affective responses of her child in structured interaction tasks. As part of the experimental design, children engaged in interaction tasks with their caregivers and also with an experimenter. This design allowed for an examination of whether the hypothesized low levels of child positive affect were specific to interactions with the caregiver.

Caregiver depressive symptoms, both current and lifetime, were hypothesized to be associated with lower levels of positive affect in both the caregiver and child during their interactions. Durbin et al. (2005) previously found that maternal depression was associated with lower levels of positive emotionality in children.
interacting with a stranger. Thus, we predicted that higher levels of caregiver depression also would be associated with lower levels of positive affect during the experimenter-child interactions. Caregiver’s beliefs about emotions (experiential avoidance, EA) were hypothesized to be negatively correlated with positive and negative affect in the child and the caregiver, as they avoid emotions. In addition, higher EA was hypothesized to be associated with lower caregiver sensitivity to child affective responses in the interaction task.
Chapter 2

METHOD

Participants

Participants were 32 female caregivers and their preschool-aged children, who were enrolled in the Early Learning Center (ELC) at the University of Delaware. The ELC provides both day-care and education for children 6 weeks to 12 years of age. It also provides services and support for families and children who are exposed to risk factors such as poverty, foster care, and disabilities. In addition, the ELC serves families by carrying out research in prevention, intervention, and education and making participation in research an integral component of the child and family’s experience at the center. Caregivers were recruited by contacting families with children attending the ELC who met the study inclusion criteria (3-5 years of age, no developmental delays). Letters informing the family about the project were attached to consent forms and left in the child’s classroom with the child’s belongings. In addition, the research coordinator at the ELC informed families about the project during the initial research meetings held with families new to the ELC. Once a caregiver signed and returned the consent form, she was assigned a code number and a link to the on-line survey with the study self-report measures. When the survey was completed, the caregiver either contacted the research coordinator to schedule an appointment for her interaction or she was sent a letter reminding her to do so.
Caregiver’s were given $20.00 as compensation for their participation in the study, and the child received a small toy.

Participating female caregivers ranged in age from 20 to 44 years old (M = 36.65, SD = 5.60). The caregivers were 68.8% Caucasian, 12.5% Black, 15.6% Asian, and 3.1% Hispanic. Our sample of caregivers was predominantly married (84.4%) or living with the child’s other parent (3.1%), but also included several caregivers who were single (6.2%) or divorced (6.3%). The caregivers tended to be well-educated, with 87.5% reporting at least some college education, and 62.5% having earned a graduate degree. The sample was predominantly affluent with high household incomes (Mdn = $90-$100,000), but several caregivers reported incomes below $50,000 (15.6%). Children ranged in age from 3 years, 1 month to 5 years, 10 months (M = 4.19, SD = 0.65) and were 67.7% Caucasian, 12.9% Black, 16.1% Asian, and 3.2% Biracial. There were slightly more boys than girls in our sample (40.6% girls), and 15.6% of the sample had been diagnosed with a disability.

**Measures**

**Current depressive symptoms.** Participants completed the Beck Depression Inventory – 2nd Edition (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report measure that assesses symptoms of depression occurring within the previous two weeks. Participants select the one item from a group of statements that best describes their symptoms over that week. Items are scored on a 0 to 3 scale, with 0 indicating no experience of the symptom and 3 indicating high levels
of the symptom. One item related to suicidal ideation was removed from the measure for this study. Total scores were used in analyses (α = 0.90).

**Lifetime depressive symptoms.** Participants completed the Inventory to Diagnose Depression – Lifetime version (IDD-L; Zimmerman & Coryell, 1987). This measure consists of 22 items that measure symptoms of past major depressive disorder based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980). Participants are asked to choose statements that best describe their symptoms during the week in their life when they felt the most depressed. These statements are rated on a scale of 0 to 4, with more severe symptoms corresponding to higher scores. In addition, participants indicate whether symptoms lasted for more or less than two weeks. We created a continuous symptom score by summing the symptom responses. This score was also made consistent with current DSM criteria (DSM-IV; American Psychiatric Association, 2000) by including only those questions that assess symptoms in the current DSM system.

The IDD is strongly correlated with other commonly used self-report measures of depression, such as the Beck Depression Inventory (BDI; r = 0.87) and the Hamilton Rating Scale for Depression (r = 0.80; Goldston, O’Hara, & Schwartz, 1990). These authors further report that the IDD has sensitivity of 70% and specificity of 87.5% in college samples, with the Schedule for Affective Disorders and Schizophrenia (SADS; Endicott & Spitzer, 1978) interview diagnoses used as the criterion measure. More recently, in a sample of first-degree relatives of individuals diagnosed with depression, the agreement between the IDD-L when administered one month apart was high (kappa = 0.77), as was the agreement with the SCID (kappa =
0.75 for the first trial, kappa = 0.68 for the second trial; Sato, Uehara, Sakado, Sato, Nishioka, & Kasahara, 1996).

Although the IDD can be used to establish the presence or absence of a past Major Depressive Disorder (MDD) diagnosis, the IDD-L continuous scores were used in all analyses in this study. The internal consistency of the IDD-L ($\alpha = 0.92$) was relatively high.

**The Acceptance and Action Questionnaire (AAQ):** The AAQ (Hayes et al., 2004) is a sixteen item self-report measure of experiential avoidance (EA). Items on the AAQ assess tendencies to make negative evaluations of distressing thoughts, images, emotions (e.g., “Anxiety is bad.”); control or alter the form and frequency of distressing material (e.g., “I try to suppress thoughts and feelings that I don’t like by just not thinking about them.”); and the inability to take action in the face of negatively evaluated thoughts, images, and emotions. Participants rate the degree to which statements apply to them on a scale from 1 (never true) to 7 (always true). High scores indicate greater experiential avoidance. The AAQ has been shown to have good internal consistency, convergent, discriminant, concurrent, and incremental validity, and treatment utility (Bond & Bunce, 2003; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hayes et al., 2004). In the current study, the AAQ had adequate internal consistency ($\alpha = 0.87$).

**Interaction Tasks**

The tasks used to assess children’s response to positive and negative emotions were adapted from Goldsmith’s Laboratory-based Temperament Assessment
Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1993) and Hess’s (1967) Etch-a-Sketch task. Each task takes approximately 5 minutes, and as recommended by Goldsmith and colleagues, breaks of 1 to 2 minutes were used in between tasks to reduce potential carryover of affective responses. Three tasks were used to induce positive affect, and four tasks were used to induce negative affect. All tasks are completed in a room at the ELC reserved for research interactions. The room holds two tables, one child-sized where the majority of interactions take place, and a round adult-sized table where the child sits during breaks. The room contains a one-way mirror through which the interactions were videotaped for later observational coding, as well as two video cameras mounted in opposite corners of the ceiling.

Children engaged in two sets of Lab-TAB interactions, one with the experimenter and another with the caregiver. The interactions with the experimenter provide a contrast for the interactions with the caregiver to examine the extent to which the child’s emotional responses are specific to the caregiver. All experimenters were female graduate and undergraduate students trained to administer the specific tasks. This choice was made because the Lab-TAB manual recommends the use of female experimenters and this also facilitates comparison with the caregivers, all of whom were female. The order of interactions (experimenter-child or caregiver-child) was counterbalanced, with half of caregiver-child dyads completing the caregiver-child interactions first. All children received tasks in the same order within the set of experimenter and caregiver interactions.
**Activation of positive affect system**

Three of the Lab-TAB tasks are designed to evoke positive affect and responses (e.g. joy, happiness, interest and engagement, excitement). During “Bubbles,” a task designed to elicit exuberance, children are shown how to use a bubble gun and then allowed to play with the bubble gun briefly. The experimenter blows bubbles for the child and asks him/her to pop them using different parts of the body.

“Story Time” is designed to elicit contentment and requires the child to create a story to go along with a story book that has only illustrations. The experimenter stays with the child during this process and then explains to the child that his or her caregiver will be arriving shortly, and the child should share the story with her. The caregiver and child are left alone while the child tells the story he or she created with the experimenter.

The “Arc of Toys” task is similar to free play and also allows for assessment of enthusiasm and activity level in a child. The experimenter arranges an assortment of age-appropriate toys on the ground and allows the caregiver and child to play with the toys for five minutes.

**Activation of negative affect system**

Three of the Lab-TAB tasks were designed to evoke negative affect and responses (e.g., sadness, disengagement, frustration, anger). ”No Stickers” is designed to elicit sadness and disappointment in the child. The experimenter tells the child that she is giving everyone a sticker today and asks the child to choose the sticker he or she would like from pictures of the stickers she has. Once the child has selected the
sticker, the experimenter leaves to retrieve the sticker and returns with an empty box of stickers. She explains that she has run out to stickers and allows the child 30 seconds to respond to this information. The experimenter then leaves the room and returns with the requested sticker, explaining that she found one last sticker in her office.

“Box Empty” is very similar to No Stickers and is also designed to elicit sadness and disappointment. The experimenter enters the room and hands a box tied with a bow to the child, while saying that she has a toy for the child because she/he has been so good. The experimenter leaves the child alone to open the box, which is empty. The child is allowed 30 seconds to respond to this unexpected situation before the experimenter returns to give the child the promised toy, saying that she forgot to put it in the box.

During “Card Matching,” which is designed to elicit frustration and related responses, the experimenter demonstrates how to look for matching cards amongst a number of facedown cards that depict various images. Once the child understands how to complete the task, the experiment leaves the room. Two of the cards do not have a matching card amongst the cards present. The child is allowed to respond to this for 30 seconds before the experimenter returns with the missing cards and explains that she had accidentally dropped the missing cards. This task can also be used to assess persistence and disengagement.

The “Etch-a-Sketch” task was added as another task to evoke frustration and related responses. It is not part of the Lab-TAB tasks. The Etch-a-Sketch task requires the caregiver and child to copy three drawings of increasing difficulty (square,
triangle, circle) using the etch-a-sketch device. The caregiver and child are instructed to each use one knob of the etch-a-sketch and told that their drawing will be traced for later evaluation. The frustrating aspect of this task is that the device cannot easily make diagonal or curved lines, so the task becomes less easily attained with each subsequent drawing.

**Procedure**

Figure 1 graphically depicts the study design. Prior to beginning the experiment, the study procedure was explained to the caregiver, and informed consent was obtained. Participating female caregivers completed the self-report measures (IDD-L, BDI, AAQ) prior to the Lab-TAB interactions with her child. These self-report measures were completed either online, or using paper and pencil.

As previously mentioned, the order of interactions (experimenter-child or caregiver-child) was varied, with half of caregiver-child dyads completing the caregiver-child interactions first. The order and tasks used with the caregiver and with the experimenter were consistent throughout the study. The experimenter and child completed Card Matching (negative), Bubbles (positive), and No Stickers (negative) tasks. The caregiver and child completed Story Time (positive), Etch-a-Sketch (negative), Arc of Toys (positive), and Empty Box (negative) tasks. These tasks were chosen and administered in the listed order for several reasons. Short breaks were introduced between tasks to minimize potential carry over. We also used tasks designed to elicit similar affect in the same order in both caregiver-child interactions and experimenter-child interactions.
**Experimenter-child interactions**

Two experimenters were present for every interaction. One experimenter (E1) was the experimenter who interacted with the child in the structured play tasks. The other experimenter (E2) was an assistant who monitored the video equipment, retrieved props, and marked time when necessary. The primary purpose of E2 was to retrieve the child from his or her classroom and then return the child after the interactions. This role was employed to ensure that the child’s knowledge of E1 was limited to the interactions they engaged in together.

The experimenter-child interactions began with E2 retrieving the child from the child’s classroom and escorting him or her to the research room. When E1 entered the room, E2 left and E1 guided the child through Card Matching. Following the completion of this task, E1 and child moved to the adult-sized table for a short break of coloring for approximately one to two minutes. E2 then entered the room after the allotted time to retrieve the props for Card Matching and give to E1 the bubble gun used in Bubbles. E1 guided the child in Bubbles, and then the child and E1 returned to the adult-sized table for another coloring break of one to two minutes. When this time was up, E2 entered the room to retrieve the bubble gun and give the pictures of stickers to E1. E1 led the child through No Stickers and then waited for E2 to return and escort the child back to his or her classroom. This series of tasks takes approximately 20 minutes to complete.

**Caregiver-child interactions**

Each female caregiver arrived for her interactions with her child either in the morning as she was dropping off her child at the ELC, or in the afternoon, prior to
picking up her child. When the caregiver arrived in the morning with her child, E2 met them at the front desk and escorted the child to the research room. She and the child waited until E1 entered the room and led the child in the first half of Story Time. E2 returned to the front desk and led the caregiver to an unoccupied office.

When the caregiver was scheduled to arrive in the afternoon to complete the interaction, E2 retrieved the child from his or her classroom approximately five minutes before her anticipated arrival. She escorted the child to the research room and waited with the child until E1 entered the room, at which point she left. E2 waited at the front desk until the caregiver arrived. She told the caregiver that her child had already started the interaction with the other experimenter and then escorted her to the same unoccupied office.

The caregiver and E2 met briefly to review the study procedures and answer any questions the caregiver had. If the caregiver completed the BDI-II more than two weeks before the interaction, she was asked to complete it again.

When the child and E1 have finished reading the story together and were coloring and the caregiver had asking any questions she had, E2 escorted the caregiver to the research room. Once the caregiver entered the room, E1 explained the instructions for Story Time to her and then left the room. When the caregiver and child completed Story Time, E1 entered the research room and asked them to move to the adult-sized table to color while she prepared for the next task.

E1 removed the props for Story Time and brought the props for Etch-a-Sketch, doing so in a manner to ensure that the caregiver and child had approximately one to two minutes to color before beginning the next task. When E1 was ready and
break time had passed, E1 asked the caregiver and child to return to the child-sized table where she had placed the etch-a-sketch. She told the child and caregiver that they could practice with the etch-a-sketch, as they would be using it in the next task. E1 left the caregiver and child alone to practice for approximately one minute, and then returned with the first shape (square) and explained the Etch-a-Sketch task to them. E1 left the room while the caregiver and child attempted to recreate the shape and returned to the room when they finished or 3 minutes had passed. She then repeated the procedure with the second shape (triangle) and the third shape (circle). When the three shapes were completed, E1 retrieved the etch-a-sketch and asked the caregiver and child to move to the adult-sized table again, while she prepared for the next task.

E1, and E2 when possible, moved the props for Arc of Toys into the research room and arranged them appropriately. When approximately one to two minutes have passed and the props were arranged, E2 left the room and E1 explained the instructions for Arc of Toys to the caregiver and child before leaving. When five minutes had passed, E1 returned to the research room to tell the caregiver and child that the task was over and asked them to sit at the adult-sized table again to color. E1, and E2 when possible, removed the props for Arc of Toys and left the room.

When one to two minutes had passed, E1 returned to the research room with the box for Empty Box and led the caregiver and child in this task. Following completion of Empty Box, E1 and E2 thanked both caregiver and child for their participation and the caregiver and child left.
**Observational Coding**

All caregiver-child and experimenter-child Lab-TAB interactions were videotaped and divided into segments based on transitions within the task where either the emotion intended to be evoked changed or the activity changed. For example, Card Matching is divided into four segments. The first segment involves the experimenter explaining and demonstrating the task to the child. The second segment begins when the experimenter leaves the child to complete the task by him or herself. The activity changes, allowing the child to behave differently now that he/she is alone. The third segment begins when the child realizes that there are cards missing. At this point, the emotion being evoked changes. The task is no longer simply assessing persistence, but also response to a surprising and potentially frustrating event. The final segment begins when the experimenter returns with the missing cards. In this instance, the activity is changing, the child is no longer alone and the experimenter helps with matching the last cards, and the emotion being evoked has also changed. The child’s tension is being relieved with the return of the missing cards.

The unit of analysis for coding was the segments described above. These segments were coded using an adapted version of the coding system used in the NICHD Study of Early Child Care (NICHD, 1999). The segments were coded for positive and negative affect on a scale from 0 (not present or not at all characteristic) to 4 (extremely characteristic) in both the caregiver and her child. In addition, the caregiver’s behaviors were coded on a 0 to 4 scale for sensitivity to child’s negative and positive emotions. Ratings are dependent on both strength and frequency of emotion expression, with a child expressing a continuous, moderate level of interest.
receiving a rating similar to that of a child who expresses a high level of interest in several brief bursts.

Positive affect, predominantly interest and engagement, were characterized by behaviors such as displays of excitement, animation, playfulness, and attention and focus on the task. Positive affect, predominantly enjoyment or happiness, was characterized by behaviors indicating contentment, enjoyment, or happiness, such as laughter, smiling, and positive tone of voice. The same categories were used for coding caregiver responses.

Negative internalizing affect was characterized by behaviors indicating sadness or frustration. Children may be observed pouting, frowning, or furrowing their brow. Caregivers may reduce eye contact, make comments related to feelings of sadness, or exhibit a more slouched or slumped body position. Behaviors indicating anger, disgust or hostility characterize the negative externalizing affect category. These types of behaviors include abruptness, whining, strident voice tone, or angling of chin upwards.

Caregiver sensitivity to the child’s negative and positive affect is the extent to which the caregiver is attuned to the child’s affective responses and uses this awareness to guide the interactions. The sensitive caregiver responds to her child’s gestures, expressions, and behaviors (e.g. looking at caregiver, reaching for her, engaging the caregiver in the task), shows good timing paced to the child’s interest and arousal level, aids with objects, directs attention as necessary, offers encouragement, and shares in positive emotions expressed by the child. The sensitive caregiver is attuned and involved and is not intrusive, controlling, or detached.
Four undergraduate research assistants were trained to code these variables in the child and caregiver during the interaction tasks. Coders were trained to a level of 80% agreement on practice tapes before coding the sample from this study. Training took approximately ten hours. Weekly coding meetings were held to prevent rater drift. Raters were blind to the caregivers’ depression status. Three quarters of the participants were coded by all four coders. Two coders coded the child in the experimenter-child interaction, and two coders coded each individual during the caregiver-child interactions in order to prevent any carryover from child to caregiver coding or from the caregiver to the child. Coders would code the child in both types of interactions approximately half of the time. Coders were rotated so that all combinations occurred at equal frequencies and idiosyncratic ratings for a given pair could be prevented. Coding became consistent and agreement improved to the point that coders were able to code the remaining of participants individually (37% coded individually). Assignments were rotated so that no coder coded more than one interaction for each participant. The average percent agreement between raters across categories was 92.5% for agreement within one point (range of agreement estimates across categories = 81.9% to 99.2%). When two coders rated the same interaction, average ratings were created for each variable in each task. Scores for each of the interaction variables were created for every task by averaging the rating from each segment within the task. These averages were then used to create an overall interaction score for each variable by averaging the score from each task within the interaction. For instance, the first segment of the experimenter-child interaction was part of the Card Matching task. Scores for each of the four affect variables for the child from this
segment were averaged with the scores from the other segments making up this task (segments 2, 3 and 4) to create a score for the child’s interest/engagement, enjoyment/happiness, and negative internal and external affect during the Card Matching task. These were then averaged with the average scores for the Bubbles and No Stickers tasks to create overall scores for the four child variables during the experimenter-child interaction.
Figure 1  Design of Present Study
Chapter 3

RESULTS

Correlations between all major variables, as well as means and standard deviations are presented in Table 1. For all analyses, depression scores and ratings of emotion and sensitivity in the laboratory tasks were treated as continuous variables. An examination of the distribution of variables revealed that BDI scores and negative externalizing affect in caregiver were positively skewed. Log 10 transformations were used to normalize the distributions. Zero-order correlations then were conducted to examine the associations between the caregiver’s depression (past and current), EA, and caregiver and child responses in the interaction tasks. Because correlations of gender with the interaction tasks variables revealed that boys expressed significantly less negative internalizing affect ($r = -0.50; p < .01$) during the experimenter interaction and less positive affect (interest-engagement; $r = -0.45; p < .05$) during the caregiver interaction, partial correlations were also conducted to control statistically for gender. These analyses are presented in Table 2.

As expected, caregiver’s current level of depression symptoms and history of depression symptoms were significantly and positively correlated (Table 1). The mean level of current depression was 4.91 (SD= 7.35), and only 9% of the caregivers reached elevated or clinical levels of depression. There was more of a range of scores on the IDD-L ($M = 12.38, SD = 10.22$), which assessed the severity of the worst
period of depression experienced in the past. Total depression scores were used in all analyses. Of the 32 caregivers in the sample, 31% endorsed experiencing five or more symptoms of depression at a level of 2 or more, and 12.5% met DSM-IV criteria for a past episode of depression. Because for the most part this sample was not currently depressed, this allowed for a more clear examination of the associations between past depression and caregiver and child responses to the interaction tasks.

**Manipulation Check**

As a manipulation check of the Lab-TAB child interaction tasks, we examined whether children expressed more positive affect (both interest/engagement and enjoyment/happiness) in the positive affect tasks than in the negative affect tasks and more negative affect (internalizing and externalizing) in tasks designed to elicit negative affect. The tasks elicited the intended affect. Child positive affect was higher in the positive tasks than in the negative tasks (all ps < .05), and negative affect was higher in the negative tasks (all ps < .05). Furthermore, children did not express more positive or negative affect in the interactions with the caregiver than with the experimenter (all ps = ns). These findings suggest that the tasks used in the caregiver-child and in the experimenter-child interactions were comparable.

**Caregiver depression, experiential avoidance, and caregiver responses to caregiver-child interactions**

The primary focus of this study was the relationship between caregiver’s depression, experiential avoidance, and affect expressed by the caregiver and child in the Lab-TAB interaction tasks. As predicted, higher caregiver lifetime depression
scores were significantly correlated with higher levels of EA and with less expression of positive affect (interest/engagement) by the caregiver in the child-caregiver interactions. Caregivers also expressed less enjoyment/happiness during the interactions, but this association did not quite reach statistical significance. The relation between past depression scores and emotional response to the Lab-TAB interactions seemed specific to positive affect, as the correlations with negation affect were not statistically significant. Current levels of depression on the BDI were not significantly associated with any of the variables, but this was most likely due to insufficient range.

Experiential avoidance was not significantly associated with less caregiver positive and negative affect during the interactions with the child, as was predicted. EA was however associated with less caregiver sensitivity to overall positive and negative child affect expressed in the interactions, as hypothesized.

**Caregiver depression, experiential avoidance, and child responses to interaction tasks**

Correlational analyses were also used to investigate the hypothesis that caregiver’s depression would be associated with less expression of positive affect in the child in interaction task with the caregiver, as well as with the experimenter. As seen in Table 1, the caregiver’s lifetime depression scores were significantly correlated with child positive affect (interest/engagement) when interacting with the caregiver but not with the experimenter, suggesting some specificity to the caregiver. However, the direction of this correlation was in the opposite direction than predicted. Higher lifetime depression scores were associated with more rather than less positive affect
expression in the child when interacting with the caregiver. There was also a tendency to express less negative internalizing affect, again only with the caregiver. As predicted, higher caregiver experiential avoidance scores were significantly associated with less child expression of negative internalizing affect with the caregiver, but EA was not significantly associated with the expression of positive affect.

To ensure that these results were not influenced by the association between gender and negative affect expression, correlations were again conducted controlling statistically for child gender. As seen in Table 2, the pattern of findings remained the similar, except that EA was significantly and positively associated with child’s positive affect (interest/engagement) when the caregiver and child interacted together. The caregiver’s level of past depression was again associated with less caregiver positive affect (interest/engagement) and remained as strong and significant as previously found. Higher levels of caregiver experiential avoidance were again associated with less sensitivity to children’s expression of positive and negative affect, but sensitivity to positive affect did not reach significance (p = 0.06). Higher past depression scores in caregivers remained significantly correlated with more child expression of positive affect (interest/engagement) during tasks completed with the caregiver. Higher scores on the AAQ again were associated with less child negative internalizing affect during tasks completed with the caregiver.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>12.38</td>
<td>10.22</td>
</tr>
<tr>
<td>IDD-L</td>
<td>4.91</td>
<td>7.35</td>
</tr>
<tr>
<td>BDI</td>
<td>48.50</td>
<td>15.28</td>
</tr>
<tr>
<td>Ch Int/Eng-Exp</td>
<td>2.60</td>
<td>.34</td>
</tr>
<tr>
<td>Ch Enj/Hap-Exp</td>
<td>1.32</td>
<td>.58</td>
</tr>
<tr>
<td>Ch NegInt-Exp</td>
<td>2.88</td>
<td>.20</td>
</tr>
<tr>
<td>Ch NegExt-Exp</td>
<td>1.95</td>
<td>.08</td>
</tr>
<tr>
<td>Ch Int/Eng-CG</td>
<td>.31</td>
<td>.33</td>
</tr>
<tr>
<td>Ch Enj/Hap-CG</td>
<td>.25</td>
<td>.53</td>
</tr>
<tr>
<td>Ch NegInt-CG</td>
<td>.20</td>
<td>.30</td>
</tr>
<tr>
<td>Ch NegExt-CG</td>
<td>.19</td>
<td>.29</td>
</tr>
<tr>
<td>CG Int/Enj</td>
<td>.06</td>
<td>.21</td>
</tr>
<tr>
<td>CG Enj/Hap</td>
<td>.05</td>
<td>.12</td>
</tr>
<tr>
<td>CG NegInt</td>
<td>.01</td>
<td>.05</td>
</tr>
<tr>
<td>CG NegExt</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>CG Sens Ch Pos</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>CG Sens Ch Neg</td>
<td>.04</td>
<td>.08</td>
</tr>
</tbody>
</table>

Table 1: Means, standard deviations, and intercorrelations of caregiver depression, experiential avoidance, and caregiver and child affect expression and behavior.
Table 1 cont.

*Note.* IDD-L = Depression Score on the Inventory to Diagnose Depression – Lifetime version; BDI = Beck Depression Inventory – 2nd Edition; AAQ = The Acceptance and Action Questionnaire; Ch Int/Eng-Exp = Child’s positive affect (interest/engagement) while interacting with experimenter; Ch Enj/Hap-Exp = Child’s positive affect (enjoyment/happiness) while interacting with experimenter; Ch NegInt-Exp = Child’s negative internalizing affect while interacting with experimenter; Ch NegExt-Exp = Child’s negative externalizing affect while interacting with experimenter; Ch Int/Eng-CG = Child’s positive affect (interest/engagement) while interacting with caregiver; Ch Enj/Hap-CG = Child’s positive affect (enjoyment/happiness) while interacting with caregiver; Ch NegInt-CG = Child’s negative internal affect while interacting with caregiver; Ch NegExt-CG = Child’s negative external affect while interacting with caregiver; CG Int/Eng = Caregiver’s positive affect (interest/engagement); CG Enj/Hap = Caregiver’s positive affect (enjoyment/engagement); CG NegInt = Caregiver’s negative internal affect; CG NegExt = Caregiver’s negative external affect; CG Sens Ch Pos = Caregiver’s sensitivity to the child’s expression of positive affect; CG Sens Ch Neg = Caregiver’s sensitivity to the child’s expression of negative affect. * p < .05. ** p < .01.
Table 2  Intercorrelations of caregiver depression, experiential avoidance, and caregiver and child affect expression, controlling for child’s gender.

<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>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>IDD-L</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>BDI</td>
<td>.47*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>AAQ</td>
<td>.43*</td>
<td>.51**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Ch Int/Eng-Exp</td>
<td>.14</td>
<td>.17</td>
<td>.11</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Ch Enj/Hap-Exp</td>
<td>.01</td>
<td>.00</td>
<td>-.06</td>
<td>.63**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Ch NegInt-Exp</td>
<td>-.33</td>
<td>.08</td>
<td>-.28</td>
<td>-.21</td>
<td>.00</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Ch NegExt-Exp</td>
<td>.02</td>
<td>-.22</td>
<td>-.23</td>
<td>.31</td>
<td>.19</td>
<td>.03</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Ch Int/Eng-CG</td>
<td>.48**</td>
<td>.22</td>
<td>.38*</td>
<td>.20</td>
<td>.22</td>
<td>-.13</td>
<td>.28</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Ch Int/Eng-CG</td>
<td>.16</td>
<td>.05</td>
<td>.09</td>
<td>.21</td>
<td>.47*</td>
<td>.22</td>
<td>.30</td>
<td>.59**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Ch NegInt-CG</td>
<td>-.30</td>
<td>-.13</td>
<td>-.46*</td>
<td>.07</td>
<td>-.07</td>
<td>-.02</td>
<td>-.22</td>
<td>-.65**</td>
<td>-.46*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Ch NegExt-CG</td>
<td>-.05</td>
<td>-.17</td>
<td>-.25</td>
<td>.31</td>
<td>.14</td>
<td>-.30</td>
<td>.13</td>
<td>-.16</td>
<td>.07</td>
<td>.51**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>CG Int/Eng</td>
<td>-.40*</td>
<td>-.24</td>
<td>-.11</td>
<td>-.08</td>
<td>.09</td>
<td>.19</td>
<td>-.02</td>
<td>-.16</td>
<td>-.02</td>
<td>.21</td>
<td>.04</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>CG Int/Eng</td>
<td>-.32</td>
<td>-.19</td>
<td>-.29</td>
<td>-.09</td>
<td>-.02</td>
<td>.24</td>
<td>-.20</td>
<td>-.07</td>
<td>-.04</td>
<td>.20</td>
<td>-.01</td>
<td>.48**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>CG NegInt</td>
<td>.03</td>
<td>.28</td>
<td>.03</td>
<td>.05</td>
<td>.09</td>
<td>.27</td>
<td>.24</td>
<td>.05</td>
<td>.17</td>
<td>.05</td>
<td>.04</td>
<td>-.04</td>
<td>-.35</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>CG NegExt</td>
<td>.00</td>
<td>.06</td>
<td>-.23</td>
<td>.10</td>
<td>.01</td>
<td>.17</td>
<td>-.10</td>
<td>-.37</td>
<td>-.05</td>
<td>.30</td>
<td>.06</td>
<td>-.23</td>
<td>-.36</td>
<td>.14</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>CG Sens Ch</td>
<td>-.36</td>
<td>-.25</td>
<td>-.35</td>
<td>-.05</td>
<td>.23</td>
<td>.43*</td>
<td>-.17</td>
<td>-.21</td>
<td>.04</td>
<td>.19</td>
<td>-.05</td>
<td>.60**</td>
<td>.70**</td>
<td>-.18</td>
<td>-.22</td>
<td>--</td>
</tr>
<tr>
<td>17.</td>
<td>CG Sens Ch</td>
<td>-.04</td>
<td>-.07</td>
<td>-.42*</td>
<td>.12</td>
<td>.22</td>
<td>.03</td>
<td>-.08</td>
<td>-.32</td>
<td>.20</td>
<td>.55**</td>
<td>.46*</td>
<td>.11</td>
<td>.16</td>
<td>.43*</td>
<td>.06</td>
<td>.17</td>
</tr>
</tbody>
</table>

*Note. IDD-L = Depression Score on the Inventory to Diagnose Depression – Lifetime version; BDI = Beck Depression Inventory – 2nd Edition; AAQ = The Acceptance and Action Questionnaire; Ch Int/Eng-Exp = Child’s positive affect (interest/engagement) while interacting with experimenter; Ch Enj/Hap-Exp = Child’s positive affect (enjoyment/happiness) while interacting with experimenter; Ch NegInt-Exp = Child’s negative internalizing affect while interacting with experimenter; Ch NegExt-Exp = Child’s negative externalizing affect while interacting with experimenter; Ch Int/Eng-CG = Child’s positive affect (interest/engagement) while interacting with experimenter; Ch Enj/Hap-CG = Child’s positive affect (enjoyment/happiness) while interacting with experimenter; Ch NegInt-CG = Child’s negative internalizing affect while interacting with experimenter; Ch NegExt-CG = Child’s negative externalizing affect while interacting with experimenter.
interacting with caregiver; Ch Enj/Hap-CG = Child’s positive affect (enjoyment/happiness) while interacting with caregiver; Ch NegInt-CG = Child’s negative internal affect while interacting with caregiver; Ch NegExt-CG = Child’s negative external affect while interacting with caregiver; CG Int/Eng = Caregiver’s positive affect (interest/engagement); CG Enj/Hap = Caregiver’s positive affect (enjoyment/engagement); CG NegInt = Caregiver’s negative internal affect; CG NegExt = Caregiver’s negative external affect; CG Sens Ch Pos = Caregiver’s sensitivity to the child’s expression of positive affect; CG Sens Ch Neg = Caregiver’s sensitivity to the child’s expression of negative affect.

* $p < .05$. ** $p < .01$. 


Chapter 4

DISCUSSION

Depression is a disorder associated with significant impairment not only for those individuals suffering from it, but also for their children. It is a disorder that is best treated as early as possible, as subsequent episodes increase the risk for more recurrent and severe future episodes.

The focus of this study was on how caregivers with higher levels of past depression and their preschool-aged children interact in tasks designed to elicit positive and negative affect. We predicted that caregivers with higher depression scores, both current and lifetime, would express less positive affect across tasks, as would their children. This sample of caregivers had a range of past depression scores, but for the most part was currently not depressed. Only three of 32 caregivers scored in clinical ranges of depression on current depression, so there was insufficient range in current depression scores. However, this also allowed us to more clearly examine the associations between past depression and child and caregiver affect expression in the interaction tasks.

As hypothesized, higher caregiver levels of lifetime depression were associated with lower levels of caregiver positive affect, especially that related to interest and engagement. They also showed lower levels of PA related to enjoyment and happiness, although the association did not reach statistical significance. Past
depression was not associated with more negative affect during the interactions. The blunted expression of positive affect is consistent with a growing body of research demonstrating the problem of hedonic deficits in adult depression, even between episodes when the person is not depressed (Joormann & Rottenberg, 2007; Gotlib et al., 1998; Rottenberg, Gross & Gotlib, 2005; Sloan, Strauss & Wisner, 2001). Joormann and Rottenberg (2007) found that currently depressed participants and those who were currently in remission but had a history of depression failed to express a bias towards positive stimuli observed in control participants. Depressed women also show hedonic deficits when exposed to affective images and asked to recall affective words (Sloan et al., 2001). Compared to nondepressed controls, these depressed women were less responsive to pleasant pictures both in subjective report and facial expressions. The depressed women were also not able to recall pleasant words as well as the nondepressed women. There is even biological evidence of hedonic deficits in depressed individuals both during and following depressive episodes. Typically the right frontal area of the brain has been associated with processing of emotional information. When brain activity in this area was examined through the use of electroencephalogram (EEG), those individuals who were either currently depressed or had a history of depression but were not currently depressed demonstrated hypoactivation in the right frontal area of the brain relative to the activity observed in the control participants (Gotlib et al., 1998). Our caregiver findings are consistent with this literature on low levels of positive affect in response to positive stimuli, even when the depression is primarily a past history and when the positive stimuli involve interacting with their own children.
An unexpected finding was that higher caregiver past depression was associated with greater child expression of positive affect (interest/engagement), which at high levels included excitement. Caregiver history of depression was also associated with less child expression of negative internalizing affect, although the latter did not quite meet statistical significance. This pattern of findings was only observed in the interactions with the caregiver and not with the experimenter.

These findings are inconsistent with previous research that suggests that children of depressed mothers express less positive emotion than children of nondepressed mothers in interactions designed to elicit positive emotionality (PE; a composite of behavioral expressions of positive affect, sociability, and engagement). For instance, Durbin et al., (2005) assessed psychopathology in parents and used the Lab-TAB to assess PE in preschool-aged children when interacting with an experimenter only. The results indicated that lower levels of PE in the child were associated with maternal depression and not with other parental psychopathology, such as anxiety disorders and substance abuse. Low levels of PE in three-year-olds have also been found to be predictive of more depressive cognitive styles four years later (Hayden et al. 2006). Children with lower PE at age three also show asymmetrical brain activity at age five or six, with less activity in the right frontal area relative to the left, a pattern commonly seen in depressed adults (Shankman et al. 2005). This inconsistency is striking, and raises questions about the constructs under investigation and potential methodological differences.

An important question in the current study was how caregivers with a history of depression interact with their children when positive and negative affect are
elicited, as well as their child’s affective response to the caregiver and experimenter. Most previous studies have investigated the role of PE in children of depressed mothers, but PE is a broader construct than positive affect. PE is conceptualized as a temperament that includes behavioral expressions of positive affect, sociability and engagement. We assessed enjoyment/happiness and interest/engagement, but not sociability, which is related to the more stable characteristic of extroversion (Watson & Clark, 1997). The coding system used in this study captures affective responses to specific interaction tasks, but does not capture trait characteristics. It would be interesting to examine how maternal depression in previous studies is associated with different components of PE in children and to better understand the contribution of sociability relative to positive affect and engagement.

Another difference between previous studies and the current study is that we included interactions with the child and caregiver in addition to assessing the child’s affective responses in interactions with an experimenter. Home observations or naturalistic interactions have been used to observe maternal behavior and the child’s behavior with his or her mother, but these interactions can be limited in the range of potential affect elicited. We reasoned that children might interact differently with their mothers than with strangers in more structured tasks designed to elicit a wide range of emotions, and indeed that seemed to be the case in this study.

Even with these differences in constructs and design, the finding that caregiver past depression was associated with more child positive affect and a tendency to express less negative affect was not expected. This pattern of response might reflect a type of compensation that involves showing more positive affect to
engage the caregiver, please her, or make her feel better. Similarly, the child might show less distress to avoid upsetting or displeasing the mother. Although speculative, this type of behavior might reflect early stages of what Boszormenyi-Nagy and Spark (1973) call parentification. This is a process in which over time the child learns to parent a parent. These children learn to attend to and regulate the parent’s emotions by suppressing their own emotions and needs, taking on family responsibilities at a young age, and even becoming the family caretaker (Byng-Hall, 2008). Taking on this role frequently leads to feelings of losing one’s childhood and social isolation. Often, while the parentified child may appear high-functioning and well adapted, she can feel inadequate, guilty, and self-blaming, often leading to low self-esteem. These feelings can put one at risk for later depression and other internalizing symptoms and disorders (Jacobvitz & Bush, 1996; Jacobvitz, Hazen, Curran & Hitchens 2004).

Related to this, we found that caregivers who reported more current and past depression also reported higher levels of experiential avoidance, which involves the use of skills, behaviors, and plans to avoid personal emotions, memories, or sensations (Hayes et al., 1996). This avoidance of emotions was also associated with lower ratings of caregivers’ sensitivity to their child’s expression of positive and negative affect. In addition, caregiver experiential avoidance was associated with children showing less negative internalizing affect with the caregiver. It is possible that those with a history of depression continue to avoid difficult emotions, even when they are not currently depressed. This would manifest as less emotional responsivity and perhaps a blunted response to child’s emotions. This possible blunting of response to child’s emotions in the caregiver may drive the child to express more positive affect.
in order to elicit a response from the caregiver. Empathic understanding has been proposed to influence parenting quality by enabling a caregiver to better understand their child’s thoughts, behaviors and motives (Coyne, Low, Miller, Seifer, & Dickstein, 2007). This increased understanding allows the caregiver to not only know what her child needs, but also how best to provide it to her through parenting behaviors. This in turn enables the caregiver to build a stronger relationship with her child. Depression has been found to be associated with decreased empathic understanding and sensitivity in mothers, and EA has been the proposed to influence this relationship by blunting her response to her child’s emotions, as well as to her own. Coyne et al. (2007) propose that depression may skew the caregiver’s perceptions of their child’s behaviors, causing them to be overly sensitive and focused on negative emotions and behaviors. This pattern of behavior might explain our finding of less negative internalizing affect in the child when interacting with the caregiver. The child may feel it necessary to reduce the expression of negative emotions in order to compensate for the caregiver’s sensitivity.

Gender was significantly and negatively correlated with child’s expression of negative internalizing affect when interacting with the experimenter, and expression of positive affect (interest/engagement) when interacting with the caregiver. After controlling for this association, the findings were essentially unchanged. However, it is important to note that our results indicate that boys expressed less interest/engagement than girls when interacting with the caregiver and also the experimenter. It is not clear what is driving this association, but there are several possibilities. Boys may have already internalized societal judgments about males’ expression of emotion indicating
weakness, and thus be less willing to freely express their emotions. This would be supported by Bosacki’s (2007) finding that greater emotion competence was associated with greater self-worth for girls, but not boys. The author suggested this result could be explained by an understanding of the societal inappropriateness of emotion competence for boys. It is also possible that boys did not feel as comfortable during the interactions and thus did not express as much emotion.

**Limitations**

There are several limitations to the present study. While our sample size of 32 caregiver-child dyads is sufficient, a larger sample would be preferable and increase statistical power. Caregivers were predominantly not currently depressed, making it unclear how well these results generalize to a clinical sample. There was greater variability in lifetime depression scores, and our findings were thus dependent on past rather than current depression symptoms. We also relied upon self-report as our measure of depression. A clinical interview would provide a better assessment of caregiver depression and other psychopathology. A better understanding of the caregiver’s psychopathology would enable us to examine the specificity of the findings to depression and also to examine the contributions of number of episodes of depression and duration of these episodes.

Measures of depression and experiential avoidance were administered before caregivers interacted with their child, but the dyadic nature of caregiver-child interactions make directionality difficult to assess, as the caregiver influences the child and the child influences the caregiver.
We were unable to examine the contribution of genetic factors, obviously a significant factor in conferring risk from biological caregiver to child. We also did not include any physiological measure of depression or emotion. Including multiple methods of assessment of the variables of interest would allow for a more comprehensive understanding of the caregiver and child affective responses to the interaction tasks. In addition, the observational coding of the interactions captured behavioral expressions of affect, but we cannot know what was experienced by the caregivers and their children.

**Conclusion**

Our results suggest that higher levels of symptoms of lifetime depression are associated with lower levels of positive affect expression in caregivers, but with higher levels of positive affect and lower levels of negative affect in her children in caregiver-child interactions. Higher levels of lifetime depression symptoms were also associated with more experiential avoidance, which was associated with less caregiver sensitivity to her child’s emotions, both positive and negative. The relation between caregiver past depression and child expression of more positive and less negative affect was not predicted, but these findings suggest the interesting possibility that children of caregivers with a history of depression might try to compensate for her blunted responsivity, even when she is not currently depressed. Our findings suggest that there might be a time when positive affect is over expressed before it is reduced and depression begins. It is possible that this over expression of positive affect is an attempt to care for or cheer up and engage a caregiver the child knows to be distressed.
Further research is needed to better understand the connections between these factors, but these findings suggest alternative processes through which depression and history of depression may influence dysfunctional emotion expression in both the caregiver who has already experienced depression and her children.
REFERENCES


