

THE LESS EXAMINED PATH: HOW PSYCHOPATHOLOGY IN CHILDREN IMPACTS
MOTHERS' MENTAL HEALTH

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DISSERTATION ABSTRACT

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Title: The Less Examined Path: How Psychopathology in Children Impacts Mothers' Mental Health

Despite the important role of mothers' emotion regulation as a component of parenting, and the evidence for bidirectional effects in parent-child relationships, there is a dearth of literature that has examined how difficult child behaviors may impact mothers' emotion dysregulation over time. The purpose of the current study was to examine the paths by which child behavior and maternal emotion dysregulation influence each other, the role of parenting stress in this relationship, and how child behavior and maternal emotion dysregulation interact to predict parenting quality. Participants were 40 dyads of mothers and their children (aged 3-4 at time 1 and 5-6 at time 2).

The current study employed a multimethod approach that utilized both self-report and observational data. Cross-lagged path models examined the direction and magnitude of effects between child behavior problems and maternal emotion dysregulation over time, and the relationship between parenting stress and maternal emotion dysregulation. Moderation analyses examined how child behavior and maternal emotion dysregulation interact to predict maternal negativity and supportiveness.

Maternal emotion dysregulation was predictive of child internalizing and externalizing behaviors, but not noncompliance or emotion dysregulation. Bidirectional effects were not

supported as child behavior did not significantly predict maternal emotion dysregulation. Parenting stress was predictive of higher levels of maternal emotion dysregulation. Maternal emotion dysregulation moderated the relationship between child internalizing and externalizing behaviors when children were aged 3-4 and maternal negativity two years later, such that the relationship between difficult child behavior and poor parenting was more pronounced for mothers who reported higher levels of emotion dysregulation.

Findings of this study demonstrate that maternal emotion dysregulation may negatively impact both child behavior and parenting. Parenting stress is indicated as a potential risk factor for increased maternal emotion dysregulation. Mothers who struggle with emotion dysregulation may constitute a population that is especially vulnerable to engaging in negative parenting in response to difficult behavior in their children. Findings highlight the importance of focusing on improving parental emotion regulation in parenting interventions, assessing for and addressing the role of parenting stress, and increasing the effectiveness of mental health practitioners in serving adult clients who are parents.

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CHAPTER I

INTRODUCTION

The role of parent is one that is held by nearly half of all women in the United States (U.S. Census Bureau, 2016). While parenthood is rewarding for many mothers, it is also a considerable stressor (Bornstein, 2002). Psychosocial stressors have been established as an important factor in the onset and maintenance of a number of mental health concerns, including depression (Kendler, Gardner, & Prescott, 2002; Gilman, Kawachi, Fitzmaurice, & Buka, 2003), borderline personality disorder (Linehan, 1993), and posttraumatic stress disorder (Green & Berlin, 1987). Additionally, higher levels of parenting stress specifically have been associated with poorer parenting (Webster-Stratton, 1990), and prospectively linked to harsh parenting practices (Le, Fredman, & Feinberg, 2017) as well as negative child outcomes (Robinson & Neece, 2015). Given the number of women who are parents, and the potential for parenting to impact individuals' psychological well-being both with and without pre-existing psychopathology, it is important to understand the ways in which this common psychosocial stressor may influence underlying mental health trajectories as well as parenting in women who are mothers.

Links between Difficult Child Behavior and Psychopathology on Maternal

Psychopathology

Much of the clinical literature on parenting focuses on the influence of mothers' mental health on her parenting behaviors and child outcomes (Zalewski, Goodman, Cole, & McLaughlin 2018). However, beyond the postpartum literature, there is considerably less known about the reverse: the impact of parenthood on maternal mental health, namely, the influence child psychopathology may have on mothers' mental health symptoms or related mental health

features such as emotion dysregulation. While emotion dysregulation underlies a variety of mental health symptoms and diagnoses (Kring & Sloan, 2009), there is a dearth of literature on how this facet of psychopathology in mothers may be impacted by symptoms of psychopathology in their children. Therefore, the current study utilizes findings from the maternal mental health literature to inform its research questions and hypotheses which focus on maternal emotion dysregulation as well as symptoms of depression and borderline personality disorder, two disorders rooted in emotion dysregulation. When limiting a literature search to only looking for studies that address child psychopathology predicting maternal psychopathology, there are surprisingly few studies that have examined this link. For example, a prospective study examined the impact of adolescent depression and disruptive behavior disorder on mothers' depressive symptoms (Sellers et al., 2016). In this study of 299 mothers with a recurrent major depressive disorder, depression symptoms in offspring was predictive of mothers' future recurrent depressive episodes, and an increase in mothers' depressive symptoms over time. Results were inconclusive regarding the impact of adolescent disruptive behavior on mothers' symptoms, providing little information regarding the comparative effects of internalizing versus externalizing symptoms on maternal psychopathology. Mothers' mood symptoms have also been predicted by difficult temperament and behavior of their young children (Allmann, Kopala-Sibley, & Klein, 2016). In this prospective study of 362 mothers and their 3-year old children, child depression, externalizing problems, and negative temperament at age 3 predicted maternal mood disorders at 6-year follow up. There is also evidence of difficult child temperament and symptoms of psychopathology impacting mental health in parents of older children. Parents of children who are defiant and inattentive have reported struggling with more negative emotions (Bussing et al., 2003). This study examined the role of child temperament and ADHD symptoms

on caregiver strain in a sample of 200 high-risk children, aged 8 years or older, and their parents (98% of whom were mothers). Results indicated that symptoms of child ADHD and oppositional defiant disorder, but not difficult temperament, were related to higher levels of caregiver strain (e.g. greater reported stress and negative emotions) in mothers. Lastly lower distress tolerance ability, an important component of emotion regulation, has been reported by parents of children who are higher in negative affect (Morford, Cookston, & Hagan, 2017). In this cross-sectional study, 602 parents of children from three developmental periods (infancy, early childhood, and late childhood) reported on their child's temperament and on their own ability to tolerate negative emotions. Parents of children higher in negative affect reported less distress tolerance across all developmental periods, highlighting the potential impact of one aspect of child psychopathology on parental emotion regulation.

While these studies constitute evidence of an association between child psychopathology and maternal psychopathology, the literature is still limited. For example, three of the four aforementioned studies focus on maternal mood symptoms as opposed to the examination of how child psychopathology impacts other aspects of maternal psychopathology. Consequently, there is a dearth of literature on the impact of child psychopathology on mothers' emotion dysregulation, which has been established as a transdiagnostic feature that is present across numerous forms of psychopathology (Kring & Sloan, 2009). Emotion dysregulation is defined as difficulty responding effectively in situations which are marked by distressing emotions, resulting in maladaptive coping strategies (Gross, 2002). While the converse of emotion dysregulation – emotion regulation – is considered to be critical for optimal parenting, there are also significant challenges to emotion regulation that are unique to the demands of being a parent (Rutherford, Wallace, Laurent, & Hayes, 2015). Broadly, optimal parenting requires the ability

to respond sensitively to difficult child behaviors (e.g., crying, misbehavior) without parents themselves becoming dysregulated. As a substantial number of mothers are living with a mental disorder that includes deficits in emotion regulation, it is likely that there are a number of women for whom difficult child behaviors are more likely to evoke emotion dysregulation and consequently exacerbate psychopathology. In order to more fully understand the links between child psychopathology and maternal psychopathology, more research is needed that explicitly looks at the influence of child psychopathology on mothers' emotion regulation.

Furthermore, as few studies have compared the relative influences of various forms of child psychopathology on maternal psychopathology, very little is known about how different aspects of difficult child emotions and/or behavior may predict increases in maternal psychopathology. What types of difficult child emotions and/or behavior are most difficult for mothers who struggle to regulate their own emotions? Certain aspects of child psychopathology may be more detrimental to mothers' mental health. For example, mothers who struggle with emotion dysregulation may find it more difficult to deal with externalizing behaviors than internalizing behaviors. While no studies have compared the effect of different child behaviors on maternal psychopathology, there is some evidence that children's externalizing problems result in more parenting stress than internalizing problems (Barroso, Mendez, Graziano, & Bagner, 2017). Internalizing behaviors (e.g., withdrawal, anxiety/depression, and somatic complaints) are often viewed as less interpersonally charged than externalizing behaviors (e.g. aggression, anger, noncompliance), which are, by definition, directed toward the child's environment. Therefore, the current study aims to examine whether externalizing behaviors may exert more negative influence on maternal psychopathology.

This is also an important empirical question due to the potential treatment implications for links between specific difficult child behaviors and maternal emotion dysregulation. If mothers who are clients are likely to experience an increase in symptoms associated with specific child behaviors, treatment which addresses this concern may be more efficacious. Additionally, treatment aimed at children with specific behavioral problems may benefit from consideration of the specific maternal factors that may be influencing children. Lastly, there may be a greater risk for detrimental parenting practices when specific child symptoms and maternal psychopathology are linked. By understanding the links between specific difficult child emotions and behaviors and maternal emotion dysregulation, we can facilitate a better understanding of the links between child psychopathology, maternal psychopathology, and poor parenting.

Parenting Stress as a Mechanism by Which Child Psychopathology Increases Maternal Psychopathology

Parenting Stress and Child Psychopathology (Parenting difficult children in general)

Parenting stress is a likely mechanism by which child psychopathology and/or difficult child behavior leads to increased mental health symptoms in mothers, and possibly increased maternal emotion dysregulation. Stress is widely understood to exacerbate psychopathology (Harkness, Hayden, & Lopez-Duran, 2015). There is evidence that individuals' mental health, particularly their levels of stress, are distinctly impacted by the experience of parenting. While parenting is considered to be a stressor in general (Bornstein, 2002), the experience of parenting a child with emotional and/or behavioral problems may be marked by considerably higher levels of stress. A systematic review and meta-analysis of the literature on parenting stress and different child clinical groups provides evidence for higher levels of parenting stress among parents of children with psychopathology, including autism and behavioral and/or mood disorders (Barroso,

Mendez, Graziano, & Bagner, 2017). This quantitative review of 133 studies highlighted several limitations of the literature. First, the fact that cross-sectional designs predominate this research prevents examination of the direction of influence between parenting stress and difficult child behavior. The authors suggest future longitudinal research that will enable examination of the trajectory of parenting stress and child behavior. Another limitation of this research is the nearly exclusive reliance on parental report of child behavior as opposed to observational measures of child behavior. It is recommended that more observational data be employed. Perhaps most importantly, the authors discuss the need for future studies to examine the pathways by which parental psychopathology may influence the relationship between parenting stress and difficult child behavior. If parenting difficult children is stressful for parents in general, it may be exceptionally stressful to parents who face the additional burden of their own mental health concerns. However, the current state of the literature is not well suited to describe these relationships. Therefore, the current study aims to address these limitations by employing a longitudinal design, which includes both parent-report and observational measures of child behavior, to elucidate the mechanisms by which child psychopathology and parenting stress may effect psychopathology in mothers.

Parenting Stress and Maternal Psychopathology (Parenting in the context of maternal psychopathology)

Given the research evidence for the intergenerational transmission of psychopathology (McLaughlin et al., 2012), it is likely that many mothers with mental disorders may be parenting children who struggle with their own emotional and behavioral problems. While little is known about the stress of parenting difficult children in the context of maternal psychopathology, there is evidence that parenting stress may be elevated in mothers with psychopathology. For example,

in a qualitative study, mothers with borderline personality disorder (BPD) report that parenting is particularly stressful for them (Zalewski, Stepp, Whalen, & Scott, 2015). Clinically referred mothers with depression, anxiety, or personality disorders have reported higher levels of parenting stress than mothers without psychopathology (Ramsauer, Muhlhan, Mueller, & Schulte-Markwort, 2016). Parenting stress may also be associated with symptom severity in parents with PTSD (Fredman, Le, Marshall, Brick, & Feinberg, 2017; Chemtob et al., 2013).

While the framework more often examined is whether parents with symptoms or diagnoses of psychopathology report more stress in the role of being a parent, it is possible that greater parenting stress actually precedes or contributes to increases in psychopathology in parents. Such a model has rarely been tested. This study aims to test a mechanistic model by which parenting stress is a pathway by which child psychopathology is associated with increases in maternal psychopathology.

Child Psychopathology, Maternal Psychopathology, and Poor Parenting

Mothers with psychopathology may constitute a group that faces unique parenting challenges, especially in the context of parenting a difficult child. Child psychopathology and parenting stress both have the potential to contribute to maternal psychopathology, as well as quality of parenting. Parenting stress has been linked to maternal affective behavior (Crnic, Gaze, & Hoffman, 2005), and parenting may be more stressful for parents with their own mental health concerns. Parenting stress has also been linked to poorer parenting practices (DeGarmo, Patterson, & Forgatch, 2004). Given these associations, it is important to examine whether there is a relationship between difficult child behavior and poor parenting that is more pronounced in mothers who struggle with psychopathology.

Difficult Child Behavior and Poor Parenting (*How child psychopathology influences poorer parenting*)

There is evidence that having a difficult child is associated with poorer quality parenting, and that children evoke specific parenting behaviors (Kiff, Lengua, & Zalewski, 2011). Children with a difficult temperament are characterized by negative emotionality, which is a general tendency toward low positive affect and high negative affect expression (Rothbart, Ahadi, Hershey, & Fisher, 2001). A prominent empirically-supported model of parent-child interactions, namely the early childhood coercion model, posits that temperamentally difficult children are prone to evoke harsh parenting responses (Scaramella & Leve, 2004). Children with difficult temperaments are also more likely to elicit parenting that is lower in affection, support, and responsiveness (Kiff, Lengua, & Zalewski, 2011). There is cross-cultural evidence that negative child emotionality is associated with more authoritarian parenting (Porter et al., 2005) and more psychological control (Cheah et al., 2016; Yang et al., 2004). Children with an anxious temperament are more likely to evoke parental overinvolvement (Hudson, Doyle, & Gar, 2009; McLeod et al., 2007). Children who are behaviorally difficult may also evoke poorer quality parenting. For example, child externalizing behaviors have been shown to elicit more punitive and harsh parental discipline (Fletcher & Johnston, 2016; Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012). Child noncompliance, which is broadly associated with externalizing problems, has been linked to more negative parenting practices in parents of children with oppositional defiant disorder (Solem, Christophersen, & Martinussen, 2011).

In order to examine both positive and negative parenting behaviors that may be impacted by difficult child behavior, the current study will examine maternal responsiveness and negativity/rejection/invalidation. There is evidence in the aforementioned studies for the impact

of difficult child behavior on these parenting domains, and these same domains may also be compromised in mothers who are experiencing psychopathology. For example, maternal emotion dysregulation has been associated with more rejection and less warmth (Saritas, Grusec, & Gencoz, 2013). Conversely, greater parental emotion regulation has been negatively associated with a lack of responsiveness and support (Morelen, Shaffer, & Suveg, 2014).

Maternal Psychopathology and Parenting a Difficult Child (*How child psychopathology influences poorer parenting in the context of maternal psychopathology*)

It is estimated that approximately 68% of adult women with mental disorders are parents (Nicholson, Biebel, Katz-Leavy, & Williams, 2002) and therefore facing the challenges inherent to parenting while simultaneously managing their own mental health symptoms. The impact of maternal psychopathology on parenthood is a growing area of research, and there is ample evidence that on average, maternal psychopathology is associated with less optimal parenting. For example, in regard to maternal depression symptoms, a large body of research shows a small to modest effect size between maternal depression and higher levels of irritability and hostility toward the child, and higher levels of disengagement with the child (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Parenting may also be impacted by mothers' emotion regulatory difficulties. Deficits in emotion regulation have been linked to detrimental parenting practices across developmental periods. For example, in children aged 5-14, maternal emotion dysregulation was associated with child maltreatment (Skowron et al., 2010). In adolescence, maternal emotion dysregulation has been linked to permissive parenting (Crandall, Ghazarian, Day, & Riley, 2016) and lower warmth/higher rejection (Saritas, Grusec, & Gencoz, 2013). It is worth noting that the majority of studies which assess the role of parental emotion regulation on parenting rely on cross-sectional data, limiting the ability to determine the direction of influence.

Given the association between difficult child behavior and poorer quality parenting, and the fact that many mothers struggle with psychopathology, it is important to examine whether maternal psychopathology may exacerbate the link between difficult child behavior and poor parenting. Although there is still a poor understanding of how child psychopathology influences parenting in mothers with psychopathology, there is some evidence in the literature that mothers with psychopathology respond more poorly to their children with psychopathology than mothers who do not have psychopathology. For example, compared to non-depressed mothers, mothers with depression are less likely to positively reinforce compliance, and more likely to respond coercively to child noncompliance in their children with ADHD (Thomas, O'Brien, Clarke, Liu, & Chronis-Tuscano, 2014). Mothers who struggle with alcohol abuse and report that their children's temperament bothers them are significantly more likely to engage in physical abuse of their child (Harris, 2008).

The present study aims to expand the clinical parenting literature by examining the impact of difficult child emotions and behavior on maternal mental health and parenting. There is little known about how parenting a difficult child may affect women who are struggling with psychopathology, and even less known about the unique impact of specific problematic child behaviors on mental health symptoms in mothers. It is worth noting that the design of the present work precludes it from accounting for potential genetic contributions versus environmental contributions to the links between maternal psychopathology and child behavior problems, as biological measures were not obtained. The present sample was recruited to contain a portion of mothers with difficulties in emotion regulation (e.g., higher levels of BPD symptoms). As both genetic and environmental factors have been established as contributing factors in the intergenerational transmission of emotional and behavioral problems in families in which a

parent has BPD (White et al., 2003), it is likely that both genetic and environmental factors play a role in determining the study findings. Therefore, it is not clear the extent to which parenting versus other familial factors may relate to child emotional or behavioral problems.

Study Aims and Hypotheses

Aim 1. The first aim will be to use a multi-method approach to examine how difficult child emotions and/or behaviors and maternal mental health are related over time, and whether specific difficult child emotions and/or behaviors have a unique impact on maternal emotion dysregulation when children are 5-6 years old..

Hypothesis 1. It is hypothesized that higher levels of difficult child emotions and/or behaviors at when children are ages 3-4 (e.g., greater internalizing/externalizing behaviors, poorer emotion regulation, and less compliance) will all be prospectively associated with increases in maternal emotion dysregulation when children are ages 5-6, accounting for difficult child emotions and behaviors at this second time point.

Aim 2. The second aim will be to test a mediation model of parenting stress on the relationship between child emotional and/or behavioral problems and maternal emotion dysregulation. This aim is contingent on the findings of Aim 1 supporting an effect of child emotional and/or behavioral problems on maternal emotion dysregulation.

Hypothesis 2. It is hypothesized that parenting stress when children are 3-4 years old will serve as an indirect effect of the relation between and difficult child emotions and/or behaviors and maternal emotion dysregulation when children are 5-6 years old.

Aim 3. The third aim will be to test a moderation model of maternal emotion dysregulation on the relationship between child emotional and/or behavioral problems and parenting.

Hypothesis 3. It is hypothesized that the association between child problems (at ages 3-4) and poorer parenting (lower supportiveness and higher negativity when children are ages 5-6) will be more pronounced for mothers with higher levels of emotion dysregulation compared to mothers with lower levels of emotion dysregulation when children are ages 3-4.

Covariates

Child gender and family income were selected as a priori covariates used when testing all study hypotheses. This decision is based on the research showing associations between child gender and family income with child internalizing/externalizing behaviors (Miner & Clarke-Stewart, 2008; Sterba, Prinstein, & Cox, 2007) and child emotion dysregulation (Raver, 2004).

CHAPTER II

METHOD

Participants

This study draws from a larger study examining the relation of maternal BPD symptoms and preschooler emotion and stress regulation. Participants at time 1 (T1) consisted of 68 mothers and their preschool-aged children ($M=48$ months old, $SD=7.6$). Children with a diagnosed developmental disability were excluded from participating. Mothers were recruited from community sources (e.g., Craigslist, a database of parents and children maintained by the university psychology department) as well as clinical sources (e.g., local mental health clinics). In order to recruit a portion of mothers with higher levels of BPD symptoms, a number of the ads specifically targeted mothers with BPD symptoms (e.g., anger problems, unstable relationships, self-harm, impulsivity, and fear of abandonment.) In order to counteract a potential association between low income and BPD symptoms (Tomko, Trull, Wood, & Sher, 2013), mothers with low income and low BPD symptoms were oversampled. The majority of the sample at time 1 was European American (63.2%), followed by multi-racial/ethnic (29.4%), Latino/Hispanic (5.9%), and African American (1.5%). The majority of mothers had completed some college (36.8%), followed by those who graduated college (26.5%), completed technical/professional school (14.7%), had post-graduate education (10.3%), some high school (5.9%), and graduated high school (4.4%). Most mothers were married or in a long-term relationship (62%), followed by those who were never married (25%) and those who were separated, divorced, or widowed (13%).

Participants at time 2 consisted of 40 dyads in which children (55% male) were ages 5-6. The majority of this sample was European American (68%), followed by multi-racial/ethnic

(30%), and Latino/Hispanic (5%). The majority of mothers had graduated college (35%), followed by those who completed some college (25%), completed technical/professional school (15%), had post-graduate education (15%), graduated high school (7.5%), and completed some high school (2.5%). Most mothers were married or in a long-term relationship (70%), followed by those who were never married (23%) and those who were separated, divorced, or widowed (7.5%).

Procedure

All procedures for time 1 and time 2 were approved by the University of Oregon Institutional Review Board. Mothers and children were invited to a laboratory on the university campus for an approximately 2.5-hour assessment. Mothers consented and children assented prior to the beginning of data collection. Children completed a series of tasks with a researcher while mothers completed a series of self-report measures in the adjacent room. Mothers and children then participated together in a series of parent-child interaction tasks. Study procedures were nearly identical at both time points with a few minor changes to reflect the developmental appropriateness of the tasks at follow up. Mothers were compensated \$50 for their participation at each time point, and children received one or two small toys that were part of the tasks.

Measures

See Table 1 for complete list of study measures, means, standard deviations, and scale alphas.

Maternal Mental Health

Emotion Dysregulation. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used at time 1 and time 2 to assess maternal dysregulation. The DERS is a 36-item self-report that includes six subscales: lack of emotional awareness, lack of emotional

clarity, limited emotion regulation strategies, difficulties with impulse control, difficulties engaging in goal-directed behavior, and nonacceptance of emotional responses. Respondents indicate their answers on a Likert scale that ranges from 1 (almost never) to 5 (almost always). The DERS is considered to have adequate validity, and good internal consistency and test-retest reliability (Gratz & Roemer, 2004).

Child Emotional and Behavioral Problems

Internalizing and Externalizing Problems. The Child Behavior Checklist (CBCL Ages 1.5-5; Achenbach & Rescorla, 2000) is a 112-item parent-report measure, used at time 1 and time 2, that assesses mental health symptoms and problem behaviors in children. Mothers are asked to rate each item on a scale of 0 (not true), 1 (somewhat or sometimes true), or 2 (very or often true). The CBCL yields overall scores for internalizing (e.g. anxious/depression, withdrawn/depressed, somatic complaints) and externalizing (e.g. rule-breaking behavior, aggressive behavior) problems. Although this version of the CBCL is meant to be used for ages 1.5 to 5, it was methodologically necessary to extend its use to slightly older children (up to age 6) at time 2 in order to have the measure consistent between both time points.

Child Emotion Dysregulation. Child emotion dysregulation was measured at time 1 and at time 2 using the locked box task (Laboratory Assessment Battery; Goldsmith & Rothbart, 1996). This task is designed to elicit frustration in response to a blocked goal and has been shown to be effective at evoking negative emotions in children (Dennis, Cole, Wiggins, Cohen, & Zalewski, 2009). In this task, children were asked to choose one toy from a selection of toys that they would like to take home. A research assistant then placed the desired toy into a clear locked box, provided the child with a set of incorrect keys, and asked the child to open the box while they ostensibly completed paperwork nearby. The child was given two minutes to attempt

opening the box, after which time the researcher would apologize for their mistake and then help the child open the box with a correct set of keys to retrieve the toy.

At a later point, the digital files were recorded by a team of trained research assistants. Child emotional expressions included happy, sad, angry, or anxious. These were coded in twelve 10-second epochs by independent coding teams at time 1 and time 2. Each child was assigned a maximum of twelve emotion codes for each time point as each of the twelve epochs could include only one emotion code. For instances in which more than when emotional expression was displayed, the emotion of the greatest intensity and/or duration was assigned as the code for that epoch. The code “neutral” was assigned to the epoch if a child displayed no emotional expression. Child emotion dysregulation is operationalized in the present study as a summed composite score of anger, anxiety, and sadness displayed during the task. See Table 2 for mean values of negative child emotional expressions. Interrater reliability was calculated based on 17 percent of cases ($N = 12$) at time 1 and 27 % of cases at time 2 ($N = 10$), which were randomly assigned and double coded by separate coders. The average Cohen’s kappa for child emotion dysregulation was .79 at time 1, representing excellent agreement for this code. The average Cohen’s kappa for child emotion dysregulation was .62 at time 2, representing moderate agreement for this code.

Child Noncompliance. Child noncompliance was measured at time 1 and at time 2 during a five-minute long observational parent-child interaction task. In the Lego task, parents and children were asked to recreate a complex figure using Lego blocks. Mothers were permitted to provide verbal assistance to their child, but instructed not to physically assist in building the figure.

Behaviors from this task were coded at a later date using the Parent-Child Interactions Observational Coding Manual (adapted from Cowan & Cowan, Lindahl, Malik, & Malik, and Rubin & Cheah). Noncompliance in this study is operationalized as lower levels of compliance using the Child Compliance code, which is scored on a Likert scale from 0 (None) to 5 (High). This code measures “the refusal to initiate or complete a request made by another person” as well as a “failure to follow a previously stated rule that is currently in effect.” (McMahon & Forehand, 2003). Noncompliance may be captured in child behaviors such as failing to follow parental instructions, engaging in off-task behaviors, or insisting on doing tasks in the child’s own way. Interrater reliability was calculated based on 20% of cases (N = 14 at time 1 and N = 7 at time 2), which were double coded by separate coders. The single measures intraclass correlation coefficient (ICC) for child noncompliance was .97 at time 1, representing excellent agreement for this code, and .59 at time 2, representing fair agreement for this code.

Parenting Stress

Parenting Stress. Parenting stress was assessed at time 1 and at time 2 with the Parenting Stress Scale (PSS; Berry & Jones, 1995). The PSS is an 18-item self-report measure in which mothers indicate their responses to items about their feelings and perceptions about being a parent (e.g., “Caring for my child(ren) sometimes takes more time and energy than I have to give”) on a Likert scale of 1 (strongly disagree) to 5 (strongly agree).

Parenting

Parenting was measured via self-report as well as through observational tasks.

Maternal Supportiveness of Child Emotions. Self-reported maternal supportiveness of child’s emotions was assessed at time 1 and at time 2 with the Coping with Children’s Negative Emotions Scale (CCNES; Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002). The CCNES

includes nine hypothetical scenarios depicting the child's expression of distress. Parents are asked indicate the likelihood on a Likert scale from 1 (very unlikely) to 7 (very likely) that they would respond in various ways to their child in each scenario. The CCNES include subscales that distinguish six different maternal responses to child emotion categories: punitive responses, minimization responses, distress responses, problem-focused responses, emotion-focused responses, and expressive encouragement responses. As is standard with this measure, scores were collapsed across subscales to calculate composite scores for maternal supportiveness of child emotions (problem-focused responses, emotion-focused responses, and expressive encouragement responses). The CCNES also includes a composite invalidating responses scale, which was not used in the current study.

Maternal Negativity, Rejection, & Invalidation. Mothers' negativity, rejection, & invalidation was measured at time 1 and at time 2 during a seven-minute long observational parent-child interaction task. In the Lego task, parents and children were asked to recreate a complex figure using Lego blocks. Mothers were permitted to provide verbal assistance to their child, but instructed not to physically assist in building the figure.

Behaviors from this task were coded at a later date using the Parent-Child Interactions Observational Coding Manual (adapted from Cowan & Cowan, Lindahl, Malik, & Malik, and Rubin & Cheah). All codes were scored on a Likert scale from 0 (None) to 5 (High). The maternal negativity, rejection, & invalidation code includes behavior that is insulting, critical, unkind, and/or negative in tone (e.g., sarcastic, irritated, hostile). It includes nonverbal behaviors such as eye rolling, frowning, closed-off body language, or harsh physical contact (e.g., grabbing or attacking). This code also captures mothers' dismissiveness of the child's emotional experience. This includes behaviors such as telling the child to stop experiencing the emotion

(e.g., “Quit crying,”) or negatively judging the child’s character (e.g., “Stop being such a baby.”) Interrater reliability was calculated based on 20% of files (N = 14 at time 1 and N = 7 at time 2), which were double coded by separate coders. The single measures ICC for maternal negativity was .79 at time 1, representing good agreement for this code, and .51 at time 2, representing fair agreement for this code.

Analytic Plan

A total of four hypotheses were tested. Prior to hypothesis testing, preliminary analyses were conducted to examine descriptive statistics and patterns of missing data. Bivariate correlations were conducted to examine relationships between key study variables and determine the plausibility of further testing.

To test H1, four cross-lagged path models were run to tease apart the reciprocal effects of child difficult emotions/behaviors and maternal emotion dysregulation. Cross-lagged models are a method of measuring the directional influence between multiple variables on one another over time, and considered to be a more effective strategy than simple correlational analysis as they account for the contribution of each variable on the other (Kearney, 2017). The direction of influence may be interpreted by comparing the relative sizes of cross-lagged coefficients, (e.g., influence may be inferred when one variable exerts an effect on the other which is not reciprocated in kind). In these models, child difficult emotions/behaviors at T1 and maternal emotion dysregulation at T1 were entered as variables X1 and Y1, respectively (see Figure 1). Child difficult emotions/behaviors at T2 and maternal emotion dysregulation at T2 were entered as variables X2 and Y2, respectively. Parallel tests were run to examine the reciprocal effects of each of the four child variables (e.g., child internalizing, externalizing, noncompliance, and emotion dysregulation) and maternal emotion dysregulation.

Contingent on the findings of Aim 1, a hierarchical linear regression model was planned to test H2. It was planned that the covariates and difficult child emotions/behavior would be entered as the independent variables predicting increased maternal emotion dysregulation at T2, and parenting stress would be entered in the second hierarchical step. When specified parameters were met, suggesting a possible indirect effect, formal mediation models would be conducted using the product of coefficients test (Preacher & Hayes, 2008).

To test H3, a moderation analysis was conducted. First, difficult child behavior variables, parenting variables, and maternal emotion dysregulation were mean centered. Then, an interaction term between each difficult child behavior variable and each parenting variable was computed. Next, four parallel linear regression models tested the main and moderating effects of each child behavior variable and maternal emotion dysregulation on parenting quality.

Missing Data

Differences in demographic characteristics of participants at time 1 versus time 2

To determine whether there were significant differences in characteristics of families who participated at both time points compared to those who participated only at time 1, the Kruskal-Wallis test was used to examine group differences based on maternal emotion dysregulation, child emotion dysregulation, family income, and child gender. There was a significant difference between the four income quartiles for time 2 participation ($p < .029$). Time 2 included a greater proportion of participants in the upper two income quartiles (63%) than at Time 1 (50%). There were no significant differences in time 1 maternal emotion dysregulation scores ($H = .934, p = .334$) or child emotion dysregulation scores ($H = .045, p = .832$) between groups. Child gender did not differ significantly between groups ($H = .013, p = .908$).

Missing task data

Of the families who completed both time points, data for observed child noncompliance and maternal negativity was missing for five families who did not complete the Lego task at time 2. Four video clips were unable to be coded due to technical error, and one video clip was missing due to child noncompliance. All families who participated at time 2 completed the Lego task at time 1. Child emotion dysregulation data was missing for two children at time 1 and four children at time 2. At time 1, one video clip was unable to be coded due to technical error, and one video clips was missing due to child noncompliance. At time 2, one video clip was unable to be coded due to technical error, and three video clips were missing due to child noncompliance. There were no significant associations between missing Lego task data or Locked Box task data and child internalizing/externalizing behavior or maternal emotion dysregulation.

CHAPTER III

RESULTS

Preliminary analyses

Before conducting the cross-lagged models, the bivariate associations across child behavior, maternal emotion dysregulation, and parenting, were examined to confirm whether gender and income should be retained as covariates in subsequent analyses. Regarding the covariates of interest, bivariate correlations revealed a significant association between gender and child externalizing behaviors at time 2. Using the Mann-Whitney test to evaluate group differences, results showed that males scored significantly higher on externalizing problems at time 2 than females (Males: $M = 39.50$, $SD = 10.53$; Females: $M = 33.00$, $SD = 9.12$; $U = 124.00$, $Z = -2.013$, $p = .044$). Within-time associations were found between income and maternal emotion dysregulation at time 1, and between income and child behavior (internalizing, externalizing, and noncompliance) at time 2. Using the Kruskal-Wallis test, results found there was a significant difference between the four income quartiles for each of these variables. Higher income was associated with lower levels of internalizing behavior ($r(38) = -.416$, $p = .008$) and externalizing behavior ($r(38) = -.445$, $p = .005$), higher levels of compliance ($r(33) = .411$, $p = .016$) and with lower maternal emotion dysregulation ($r(38) = -.391$, $p = .014$). Therefore, gender and income were retained as covariates in all analyses. Additional bivariate associations pertinent to each of the study aims are described below. Overall, the nature of associations between key study variables supported the study's analytic approach and therefore further analyses were conducted as planned.

Changes in child behavior, parenting, and maternal emotion dysregulation from time 1 to time 2

Mean scores and standard deviations for key study variables at times 1 and 2 are presented in Table 1, along with t- and p-values for changes over time. There were no significant differences between children's internalizing behaviors or children's externalizing behaviors from time 1 to time 2. Children displayed significantly more compliance and less emotion dysregulation over time. Maternal supportiveness increased from time 1 to time 2, while there were no significant changes in maternal negativity or parenting stress. On average, maternal emotion dysregulation displayed a significant decrease over time. However, while maternal emotion dysregulation on average decreased from time 1 to time 2, 25% of mothers ($N = 10$) demonstrated an increase in emotion dysregulation.

Longitudinal relationships between child behavior, parenting, and maternal psychopathology

Cross-lagged models of child behavior and maternal emotion dysregulation

The first aim of this study was to examine the longitudinal relationships between difficult child behavior and maternal emotion dysregulation, and whether there were differences in the relationships between specific child behaviors and maternal emotion dysregulation. Cross-lagged path models were used to examine and compare the direction of effects.

Analysis for this aim was conducted with the MPlus statistical software package (Muthen & Muthen, 1998-2012). Cross-lagged models were estimated for maternal emotion dysregulation and child internalizing and child externalizing behavior. Two parallel models were run to examine the longitudinal relationships between maternal dysregulation and observational measures of child behavior (child noncompliance and child emotion dysregulation). Child gender and family income were included as covariates. A chi-square test of model fit for the baseline model was examined for each model. A good fit is determined by a significance level of .05 or less. In smaller sample sizes such as this one, the chi-square test is recommended above using the

Comparative Fit Index (CFI) or the Tucker-Lewis Index (TLI) as a method of determining model fit. This is because the problem of statistical rejection of a model due to residuals which are not practically significant does not occur as it may in larger sample sizes (Anderson and Gerbig, 1984). Family income and child gender were included as covariates in all of the models.

Model 1: Child internalizing behavior and maternal emotion dysregulation.

The first model tested for cross-lagged and within-time associations between maternal emotion dysregulation and child internalizing behavior. A chi-square test of model fit for the baseline model indicated that the model was a good fit to the data, $X^2(14) = 93.48, p < .001$. There was no significant temporal stability for child internalizing behavior ($\beta = .12, p = .443$). Maternal emotion dysregulation displayed significant temporal stability from time 1 to time 2. ($\beta = .73, p < .001$). Child internalizing behavior and maternal emotion dysregulation were significantly associated at time 1 ($\beta = .55, p < .001$), and at time 2 ($\beta = .50, p < .001$). Income and maternal emotion dysregulation at time 1 were significantly associated ($\beta = -.28, p = .01$). There were no significant associations found between child gender and maternal emotion dysregulation or child internalizing behavior.

Figure 2 shows that one cross-lagged effect was significant in that higher levels of maternal emotion dysregulation at time 1 were associated with higher levels of child internalizing problems at time 2 ($\beta = .39, p = .015$). The opposite relationship was not supported as child internalizing behavior at time 1 was not significantly related to maternal emotion dysregulation at time 2 ($\beta = .08, p = .706$).

Model 2: Child externalizing behavior and maternal emotion dysregulation.

The second model tested for cross-lagged and within-time associations between maternal emotion dysregulation and child externalizing behavior. A chi-square test of model fit for the

baseline model indicated that the model was a good fit to the data, $X^2(14) = 112.97, p < .001$. There was significant temporal stability for child externalizing ($\beta = .36, p = .017$) and for maternal emotion dysregulation between time points ($\beta = 0.830, p < .001$). There was a significant association between child externalizing behavior and maternal emotion dysregulation at time 1 ($\beta = .49, p < .001$) and at time 2 ($\beta = .44, p = .001$). Income and child externalizing behavior at time 1 were significantly associated ($\beta = -.38, p = .005$). There were no significant associations between income and maternal emotion dysregulation or child externalizing behavior. Gender and child externalizing behavior at time 2 were significantly associated ($\beta = -.49, p = .027$).

Evidence for one cross-lagged effect is demonstrated in Figure 3, depicting higher levels of maternal dysregulation at time 1 predicting higher levels of child externalizing problems at time 2 ($\beta = .40, p = .001$). The opposite relationship was not supported as child externalizing behavior at time 1 was not significantly related to maternal dysregulation at time 2 ($\beta = -.011, p = .29$).

Model 3: Child noncompliance and maternal emotion dysregulation.

The third model tested for cross-lagged and within-time associations between maternal emotion dysregulation and child noncompliance. A chi-square test of model fit for the baseline model indicated that the model was a good fit to the data, $X^2(14) = 58.14, p < .001$. There was not significant temporal stability between child noncompliance at time 1 and at time 2 ($\beta = .33, p = .14$). There was significant temporal stability for maternal emotion dysregulation between time points ($\beta = .78, p < .001$). There was not a significant association between child noncompliance behavior and maternal emotion dysregulation at time 1 ($\beta = -.18, p = .18$) or at time 2 ($\beta = -.012, p = .67$). Income and maternal emotion dysregulation at time 1 were significantly associated ($\beta =$

-.33, $p = .016$). There were no significant associations found between child gender and maternal emotion dysregulation or child noncompliance.

No cross-lagged effects were revealed for the relationship between maternal emotion dysregulation at time 1 on child noncompliance at time 2 ($\beta = .15, p = .53$), or between child noncompliance at time 1 on maternal emotion dysregulation at time 2 ($\beta = -.01, p = .96$). (see Figure 4). There was a trending association between noncompliance and income ($\beta = .378, p = .063$).

Model 4: Child emotion dysregulation and maternal emotion dysregulation.

The fourth model tested for cross-lagged and within-time associations between maternal emotion dysregulation and child emotion dysregulation. A chi-square test of model fit for the baseline model indicated that the model was a good fit to the data, $\chi^2(14) = 56.44, p < .001$. There was significant temporal stability for child emotion dysregulation ($\beta = .37, p = .034$) and for maternal emotion dysregulation between time points, ($\beta = .77, p < .001$). There was not a significant association between child emotion dysregulation and maternal emotion dysregulation at time 1 ($\beta = .03, p = .89$) or at time 2 ($\beta = -.14, p = .44$). Income and maternal emotion dysregulation at time 1 were significantly associated ($\beta = -.35, p = .013$). There were no significant associations found between child gender and maternal emotion dysregulation or child emotion dysregulation.

No cross-lagged effects were revealed for the relationship between maternal emotion dysregulation at time 1 on child emotion dysregulation at time 2 ($\beta = -.21, p = .44$), or between child emotion dysregulation at time 1 on maternal emotion dysregulation at time 2 ($\beta = .09, p = .31$) (see Figure 5).

Cross-lagged model of parenting stress and maternal emotion dysregulation

The second aim of this study was to examine whether parenting stress mediated the relation between child difficult behavior and later maternal emotion dysregulation. A mediation model was initially planned for this, but in light of the nonsignificant findings for the path models of child behavior predicting maternal emotion dysregulation, a mediation model was not warranted. Instead, conducting a cross lagged model of the relation between parenting stress and maternal emotion dysregulation was deemed to be informative as it addresses mechanistically how maternal emotion dysregulation may be impacted by the stressors regarding the role of parenting. Analysis for this aim was conducted with the MPlus statistical software package (Muthen & Muthen, 1998-2012). To better understand the relationship between parenting stress and maternal emotion dysregulation, a cross-lagged model was estimated for these variables to examine and compare the direction of effects. Child gender and family income were included as covariates.

This model tested for cross-lagged and within-time associations between parenting stress and maternal emotion dysregulation. A chi-square test of model fit for the baseline model indicated that the model was a good fit to the data, $X^2(14) = 134.26, p < .001$. In this model, maternal emotion dysregulation displayed significant temporal stability between times 1 and 2 ($\beta = .992, p < .001$). Parenting stress displayed significant temporal stability between times 1 and 2 ($\beta = .730, p < .001$). There were significant within-time associations between maternal emotion dysregulation and parenting stress at time 1 ($\beta = .713, p < .001$), and at time 2 ($\beta = .443, p < .05$). Income and maternal emotion dysregulation at time 1 were significantly associated ($\beta = -.24, p = .016$). There were no significant associations found between child gender and maternal emotion dysregulation or parenting stress.

Figure 6 shows that a cross-lagged effect was trending toward significant in that higher levels of parenting stress at time 1 were associated with higher levels of maternal emotion dysregulation at time 2 ($p = .072$). The opposite relationship was not supported as maternal emotion dysregulation at time 1 was not significantly related to parenting stress at time 2 ($p = .548$).

The moderating role of maternal psychopathology on the longitudinal relationship between child behavior problems and parenting

The third and final aim of this study was to examine whether maternal emotion dysregulation moderated a relationship between difficult child behavior and parenting quality over time. Bivariate associations between these key variables were examined prior to testing linear regression models. Child internalizing behavior at time 1 was associated with greater maternal emotion dysregulation at time 1, $r(36) = .60, p < .001$, and greater maternal negativity at time 2, $r(32) = .58, p < .001$. Child externalizing behavior at time 1 was associated with greater maternal emotion dysregulation at time 1, $r(36) = .58, p < .001$, and greater maternal negativity at time 2, $r(32) = .59, p < .001$. Maternal emotion dysregulation at time 1 was associated with greater maternal negativity, $r(33) = .58, p < .001$, and less support at time 2, $r(38) = -.59, p < .001$. Given the associations between these variables at the bivariate level, a moderation model was considered plausible.

A linear regression approach was utilized to test the main and moderating effects of child behavior on maternal emotion dysregulation and parenting quality. Eight parallel linear regression models were run to examine these effects. Statistical significance was evaluated at the $p < .00625$ (computed as $.05/8$ tests) level to correct for this number of models and protect against Type I error. In the first step of each model, the covariates of income and child gender,

and two variables were included: maternal emotion dysregulation and one of the child behavior variables. In the second step, the interaction variable of maternal emotion dysregulation and the child behavior variable was entered. One of the parenting variables (e.g., maternal negativity or maternal supportiveness) was entered in as the dependent variable. All variables were mean-centered prior to creating the interaction terms to minimize the likelihood of multicollinearity (Aiken & West, 1991).

Table 4 provides results of testing for these main and moderating effects. A moderation model was not supported for the effects of child noncompliance or child emotion dysregulation on parenting quality. Additionally, moderation was not supported for the effects of any child behaviors on maternal supportiveness. A moderation model was supported for the effect of maternal emotion dysregulation on the relationship between child externalizing behavior and maternal negativity ($F = 6.29, p = .001$) as well as on the relationship between child internalizing behavior and maternal negativity ($F = 7.64, p = .001$).

Plots were generated to further examine the nature of the two significant moderation effects (see Figures 6 and 7). The plots suggest that, as child internalizing or externalizing behavior increases, maternal negativity increases in general for all levels of maternal emotion dysregulation. There appears to be an interaction effect of child internalizing ($\beta = .42$) and externalizing ($\beta = .32$) behaviors and maternal emotion dysregulation, such that the effect of difficult child behavior on parenting is exacerbated in the context of higher levels of maternal emotion dysregulation.

CHAPTER IV

DISCUSSION

It is well accepted that psychopathology in mothers confers risk for the onset of psychopathology in children (McLaughlin et al., 2014; Goodman & Gotlib, 2002). Additionally, it is well established that parents and children influence each other's behavior (Pardini, 2008; Sameroff & Mackenzie, 2003). However, it is less well understood how child difficult behaviors or emotions and child psychopathology may confer risk for increases in psychopathology in mothers over time. The present study aimed to better understand the paths by which difficult child behavior and maternal emotion dysregulation influence each other, how parenting stress plays a role in understanding this relationship, and, finally, how child behavior and maternal emotion dysregulation interact to predict the quality of parenting. By focusing on maternal emotion dysregulation, this study expands the field's understanding of the relationship between child behavior and maternal psychopathology beyond the more often studied discrete diagnostic categories, such as maternal depression, and advances scientific knowledge of a construct that underlies numerous forms of psychopathology and which is increasingly being identified as a critical component of parenting (Rutherford, Wallace, Laurent, & Hayes, 2015).

Overview of Findings

Broadly, results of this study demonstrate that maternal emotion dysregulation has a negative impact on both child outcomes and parenting behavior. While difficult child behavior resulted in poorer parenting in the context of higher levels of maternal emotion dysregulation, parent effects were generally found to have a greater impact on dyadic relationships throughout the study analyses, as opposed to a more reciprocal relationship between child behavior and maternal emotion dysregulation. First, findings of this study demonstrate an effect of maternal

emotion dysregulation when children were aged 3-4 on subsequent increased child internalizing and externalizing behaviors two years later. Contrary to study hypotheses, child internalizing and externalizing behaviors at ages 3-4 did not significantly predict maternal emotion dysregulation two years later. These findings support a unidirectional relationship between self-reported maternal emotion dysregulation and mother-reported child behavior problems during the preschool period. However, even the unidirectional relationship was not supported for observational measures of child behavior (e.g., noncompliance and emotion dysregulation).

Study findings also indicate a potential effect of parenting stress on maternal emotion dysregulation, such that greater levels of self-reported parenting stress when children were 3- to 4-years old trended toward predicting higher levels of maternal emotion dysregulation two years later. Maternal emotion dysregulation was not found to predict subsequent levels of parenting stress. Lastly, maternal emotion dysregulation was found to be a significant moderator of the relationship between child internalizing and externalizing behaviors at 3- to 4-years old and observed maternal negativity two years later. These child behavioral problems were prospectively associated with greater maternal negativity in the overall sample, and this relationship was exacerbated for mothers who reported higher levels of emotion dysregulation at compared to mothers who reported lower levels of emotion dysregulation at time 1. This finding suggests that child internalizing and externalizing behaviors evoke negative responses from mothers, and that mothers who are struggling with higher levels with emotion dysregulation may find these behaviors even more aversive than other mothers, responding with greater negativity. This relationship was not found when examining the association between child internalizing and externalizing behaviors on self-reported parenting (e.g., maternal supportiveness), or between observed child behavior (e.g., noncompliance or emotion dysregulation) on poor parenting.

Bidirectional Effects between Difficult Child Behavior and Maternal Emotion

Dysregulation

The first aim of this study was to examine the bidirectional relationship of maternal emotion dysregulation and children's problem behaviors, and whether specific child behaviors (e.g., internalizing and externalizing behaviors, noncompliance, and emotion dysregulation) have a unique effect on maternal emotion dysregulation. Four parallel cross-lagged path models were conducted to examine and compare the direction of effects of these four types of child behavior and maternal emotion dysregulation. Results of this model provided support for maternal emotion dysregulation predicting child internalizing and externalizing behavior. While it was hypothesized that child behavioral problems would exert effects in the model by predicting higher levels of maternal emotion dysregulation, results did not support a bidirectional influence of parent and child factors. Instead, the findings suggest that, in this sample, maternal emotion dysregulation is the dynamic factor in the relationship between parent and child mental health. This finding is consistent with literature which has established an association between maternal emotion dysregulation and the development of child internalizing and externalizing behavior. Notably, results of a recent study of similarly aged children (3- to 7-years old) which utilized the same measures for maternal emotion dysregulation and child internalizing and externalizing behaviors as the present study provide support for maternal emotion dysregulation predicting child internalizing and externalizing problems (Crespo, Trentacosta, Aikins, & Wargo-Aikins, 2017). In other studies, maternal emotion dysregulation has been linked to child anxiety (Cao, Powers, Cross, Bradley, & Jovanovic, 2017; Kerns, Pincus, McLaughlin, & Comer, 2017), depression (Brown et al., 2015), and a broad range of other internalizing and externalizing behavioral problems (Kochanska, Clark, & Goldman, 1997). Conversely, there is evidence that

better maternal emotion regulation may serve as a protective factor against later development of child internalizing and externalizing problems (Kliewer et al., 2004),

Additionally, many studies have examined the relationship between disorders marked by emotion dysregulation, such as maternal mood and personality disorders, and child internalizing/externalizing behaviors. Studies of maternal borderline personality symptoms are of particular relevance given that emotion dysregulation is considered to be the core feature of borderline personality disorder (BPD) (Glenn & Klonsky, 2009). A systematic review of the literature on maternal borderline disorder/symptoms and child outcomes found that children of mothers with symptoms of BPD are more likely to develop internalizing and externalizing disorders (Eyden, Winsper, Wolke, Broome, & MacCallum, 2016).

The present study makes a unique contribution in its examination of the bidirectional relationship between child emotional and behavioral problems and maternal mental health and maternal emotion dysregulation in particular. While a number of studies provide evidence for the influence of maternal emotion regulation on child emotion regulation and related psychopathology, far fewer studies have examined how emotionally dysregulated behavior in children may likewise influence parental emotion dysregulation. A study of 431 dyads of mothers and their 2- to 6-year old children found that children's emotion dysregulation was associated with both maternal emotion dysregulation and maternal posttraumatic stress disorder symptoms (Pat-Horenczyk et al., 2015). In a study of 109 parents of 4- to 12-year old children with autism spectrum disorder, children's difficult emotions and behavior predicted parental distress (e.g., stress, anxiety, and depression) (Firth & Dryer, 2013). A longitudinal study of 91 families of children ages 7- to 9-years old provides support for the impact of child psychopathology on paternal mental health, as child externalizing behaviors were found to

predict fathers' emotion dysregulation (e.g., expressed hostility) (Carrere & Bowie, 2012). In another longitudinal study, Raposa, Hammen, & Brennan (2011) found that child psychopathology, as measured by the number of past clinical diagnoses leading up to age 15, was predictive of subsequent maternal depression even after controlling for family income and mothers' past depression history.

A systematic review on the role of emotion regulation in parenthood suggests that a critical area of future research will be the bidirectional nature of emotional regulatory influences between parents and children (Rutherford, Wallace, Laurent, & Mayes, 2015). Similarly, a meta-analysis on the relationship between maternal depression and child psychopathology (Goodman et al., 2011) highlights the need for greater examination of bidirectional associations between maternal depression and child behavioral problems. One such study of 731 families with children aged 2- to 5-years old examined bidirectional effects between child oppositional behavior and maternal depression (Choe, Shaw, Brennan, Dishion, & Wilson, 2014). While significant bidirectional associations were found between maternal depression and child oppositional behavior from ages 2 to 3, these reciprocal relations were less prominent as children aged up to 5-years old. Instead, results showed that child oppositional behavior predicted maternal depression from ages 3 to 4, and ages 2 to 5, while maternal depression predicted child oppositional behavior from ages 4 to 5. Another study utilizing the same sample examined transactional associations between maternal depression and child conduct problems (Hails, Reuben, Shaw, Dishion, & Wilson, 2017) and found that, as in the earlier study, cross-lagged effects of reciprocal parent and child effects were stronger when children were 2- and 3-years old compared to children aged 3 and 4 years old.

Researchers in these studies theorized that reciprocal associations between maternal depression and child behavior were less prominent as children aged due to the typically decreasing levels of such behavior through childhood, as well as the decrease in time spent with mothers as a function of beginning to attend school. These factors may be of relevance to the current study, which found only significant effects of maternal emotion dysregulation on subsequent child behavior, and did not support a bidirectional relationship between child behavior and maternal emotion dysregulation. The age of the current study's sample coincides with the age at which bidirectional findings of the two aforementioned studies become less prominent. Findings of the current study may be, in part, a function of typical developmental changes, such as overall decreases in children's externalizing behavior between ages 3-4 and ages 5-6, and more time spent outside of the home, both of which may serve as a buffer against increased maternal emotion dysregulation related to difficult child behavior. It is possible that, had data been gathered at an additional time point, when children were aged 2- and 3, a pattern of results that supported bidirectionality may have emerged.

The limited research on bidirectional effects of parental and child psychopathology symptoms is inconclusive, and findings appear to vary partially as a function of developmental timing. Some studies suggest that parental symptoms are a stronger predictor of child symptoms than the reverse. A study of 153 preschoolers and their fathers found that fathers' depression was a predictor of subsequent child depression, while child depression was not predictive of later paternal depression (Tichovolsky, Griffith, Rolon-Arroyo, Arnold, & Harvey, 2016). However, in a younger sample of infant children and their mothers and fathers, a clear bidirectional effect was noted (Brooker et al., 2015). In this study, parental anxiety when children were 9-months old predicted children's negative affect nine months later, and children's negative affect at that time

point was predictive of greater parental anxiety 18 months later. It may be that, in infancy and early childhood, children's behavior has a more deleterious effect on parents' mental health when children are developing more rapidly and adults are more newly adjusting to the role of being a parent. As children develop cognitively and become more interactive social partners during the preschool period, they may develop a greater awareness of their parents' emotionally dysregulated behavior, resulting in stronger effects of parental symptoms on child behavior during this time period.

While maternal emotion dysregulation was found to predict child internalizing and externalizing behaviors, no such relationship was supported for the variables of child noncompliance and child emotion dysregulation. It is possible that the method of report may have influenced these findings, as child internalizing and externalizing behaviors were measured by mother report, while child noncompliance and emotion dysregulation were measured through observation in the laboratory and subsequent coding by trained coders. Methodological issues have been raised regarding the accuracy of maternal reports of child problem behaviors in the context of maternal psychopathology, such as maternal depression (Ordway, 2011) and this warrants discussion as to how to interpret these results. Mothers with depressive symptoms have been found to more frequently report child behavioral problems than mothers without depressive symptoms (Leckman-Westin, Cohen, & Stueve, 2009). There is also evidence that current maternal psychological distress is associated with more negative ratings of their child's behavior on the Child Behavior Checklist (Hennigan, O'Keefe, Noether, Rinehart, & Russell, 2006) and that parenting stress is associated with maternal ratings of higher child internalizing and externalizing behaviors (Ostberg & Hagekull 2013).

It has been proposed that the phenomenon of greater reports of child behavioral problems by mothers experiencing psychopathology may be a result of one of two models. It has been theorized that maternal depression may be associated with either a) a distortion model, in which distorted perceptions of child behavior (e.g., a negative cognitive bias in depressed mothers leading to overreporting of negative child behavior) or b) an accuracy model, in which children of mothers with depressive symptoms display more problematic behavior at home than in other contexts, which results in more accurate maternal reports of child behavior than that of teachers or other informants (Fergusson, Lynskey, & Horwood, 1993). While this model specifies the role of maternal depression in reporting child behavioral problems, it is applicable in the context of the transdiagnostic feature of maternal emotion dysregulation. However, a recent study on mothers with high emotion dysregulation demonstrated these mothers to be accurate reporters of their infant children's emotional expressions compared to observational ratings of child emotional expression (Whalen, Kiel, Tull, Latzmen, & Gratz, 2015). It is possible that, in the current sample, mothers with greater emotion dysregulation may have reported higher levels of child internalizing and externalizing behaviors as a function of perceiving higher levels of such problem behaviors. Another potential explanation is that mothers may have been reporting accurately on their children's higher levels of behavioral problems, but these children may have demonstrated more compliance and less emotion dysregulation in the laboratory environment than they typically do at home, resulting in a discrepancy between reported and observed child behavioral problems. There is evidence from multimethod assessments of preschool-aged children's behavior that there may be a lack of convergence between parent-reported and observed child behavior (Majdandžić & van den Boom, 2007). Additionally, while parent-child interaction tasks are generally considered to

provide important information, it has also been recommended that measures be taken to increase the ecological validity of these tasks (Saini & Polak, 2014).

Links Between Parenting Stress and Maternal Emotion Dysregulation

The second aim of this study was to examine the bidirectional relationship of parenting stress and maternal emotion dysregulation. A cross-lagged path model was conducted to examine and compare the direction of effects of parenting stress and maternal emotion dysregulation. Study findings indicate that parenting stress may be a predicting factor of later increased maternal emotion dysregulation. Although parenting stress did not significantly predict maternal emotion dysregulation, this relationship did trend toward significance, while maternal emotion dysregulation did not predict (on a significant or trending level) parenting stress. This trending relationship between parenting stress and later maternal emotion dysregulation is congruent with the research that shows parenting stress predicting increased parental depression (Farmer and Lee, 2011) and depression/anxiety (Sakkalou, Sakki, O'reilly, Salt, & Dale, 2018) as well as research showing links between higher levels of parenting stress and maternal emotion dysregulation (Cao, Powers, Cross, Bradly, & Jovanovic, 2017; Ramsauer, Muhlhan, Mueller, & Schulte-Markwort, 2016).

While a number of studies have demonstrated links between parenting stress and child internalizing and externalizing problems in younger children (Costa et al., 2006; Mantymaa et al., 2012; Crnic et al., 2006), comparatively fewer have examined the impact parenting stress may have on mothers' own mental health. There is evidence for the potential deleterious effects of parenting stress in the literature on parenting children with developmental disabilities. A study of 111 mothers of children with autism spectrum disorders (Tomeny, 2011) revealed that parenting stress mediated the relationship between children's symptom severity and mothers'

symptoms of psychopathology, suggesting that parenting stress may be a pathway by which parents of children with emotional or behavioral problems come to develop their own psychopathology. Although much of the research on the psychological effects of parenting stress on parents focuses on families of children with developmental disabilities, it is possible that parenting stress has a similar effect in parents of children with other behavioral challenges, such as internalizing and externalizing problems.

There are a number of studies outside of the developmental disability literature, such as studies of parenting stress and maternal depression, which have established links between parenting stress and mothers' mental health. However, there are few which utilize a longitudinal design to test a model of parenting stress predicting maternal mental health. There is evidence of such a relationship in a study of mothers with postpartum depression, which utilized cross-lagged path models to examine both unidirectional and bidirectional effects of parenting stress and depressive symptoms (Thomason et al., 2014). Findings were similar to those of the current study as parenting stress was predictive of maternal mental health symptoms, but a reciprocal relationship of maternal symptoms predicting parenting stress was not found. This suggests that parenting stress could precede increases in maternal mental health symptoms, as opposed to higher levels of maternal psychopathology leading to greater parenting stress.

The potential for the specific stressor of parenting stress to worsen a mother's emotion regulatory abilities is especially concerning because emotion regulation has been shown to serve as a protective factor for coping with life stressors (Hopp, Troy & Mauss, 2011). While the present study was unable to examine such a relationship given the limited number of time points, it is also possible that increased emotion dysregulation at one point in time may lead to increased levels of parenting stress at a later point in time due to mothers' decreased ability to adequately

respond to and cope with the ongoing demands of parenting. Similar to considerations regarding timing effects on the bidirectional relationships between child behavior and maternal emotion dysregulation, there may also be an effect of child developmental stage on the relationship between parenting stress and maternal symptoms. While studies of bidirectional parent-child effects do not typically examine a trajectory of sufficient length to examine relationships on a long-term scale, it is possible that, like other factors related to parenting (e.g., exposure to child behavior problems), parenting stress may fluctuate to some extent as a function of stressors related to the child's age and development. For example, there is evidence that child internalizing behavior significantly effects maternal depression during early and middle childhood, but not at later time points (Jaffee & Poulton, 2006). However, there is evidence for stability of parenting stress during the preschool period in a longitudinal study of children who were similarly aged to those in the current study (Crnic, Gaze, & Hoffman, 2005). This study assessed parenting stress in a sample of 125 children and their mothers every 6 months when children were aged 3- to 5-years old, with findings indicating that parenting stress remained stable across this time period. As there is a dearth of literature to date on the trajectories of parenting stress on maternal mental health symptoms during different developmental stages, it is difficult to compare the findings of the current study to other research findings.

Regardless of the stressors unique to specific developmental stages, unlike other forms of stress which are occasional and discrete, parenting stress is by nature a chronic stressor as the demands of parenting are ongoing and must be met daily. Chronic stressors are particularly damaging due to their ability to compromise physical and mental health (McEwen, 1998), which may in turn lead to even further difficulties in emotion regulation and perpetuate maladaptive patterns that compromise both parent and child mental health. This highlights the importance of

identifying factors likely to lead to increased parenting stress to inform successful intervention efforts.

Child Behavior, Maternal Emotion Dysregulation, and Poor Parenting

The final aim of this study was to examine a possible moderating effect of maternal emotion dysregulation on the relationship between child behavior and parenting quality. The findings of this model indicated that, in dyads in which mothers experienced higher maternal emotion dysregulation, there was a pronounced relationship in which child internalizing and externalizing behaviors predicted poorer parenting quality. These findings provide support for the impact of maternal emotion dysregulation on parenting practices, an association which is pronounced in the context of child emotional and behavioral problems. As with the findings for the relationship between maternal emotion dysregulation and child behavior problems, this relationship was only supported for mother-reported child behavioral problems (e.g., internalizing and externalizing) and not observed child behavioral problems (e.g., noncompliance and emotion dysregulation). This finding was also only significant for observed parenting (e.g., maternal negativity) and not self-reported parenting (e.g., supportiveness).

The relationship between maternal emotion dysregulation and maternal negativity/rejection/invalidation is consistent with evidence that maternal emotion dysregulation is associated with more maternal negativity (Deater-Deckard, Li, & Bell, 2015), rejection (Saritas, Grusec, & Gencoz, 2013), punitive parenting (Kim et al., 2009), parent-child aggression (Rodriguez, Baker, Pu, & Tucker, 2017) and less supportive parenting (McCullough, Han, Morelen, & Shaffer, 2017; Morelen, Shaffer, & Suveg; 2014). A longitudinal study which examined the role of emotion regulation in parenting practices of mothers with ADHD symptoms found that maternal emotion regulation mediated the association between mothers'

symptoms and harsh parenting of adolescent children (Mazursky-Horowitz et al., 2015).

Previous research has shown mothers who reported higher levels of emotion dysregulation demonstrated more negativity in response to their adolescent children's negative emotions during observed parent-child interactions (Martin, Kim, & Freyd, 2018). Together with the findings of the current study, this study suggests that mothers who struggle with regulating their own emotions may demonstrate deficits in responding to negative emotions in their children as well. Conversely, there is evidence that higher emotion regulation in parents is associated with more positive parenting behaviors (Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003).

Findings of the current study suggest that maternal emotion dysregulation may be a potential mechanism by which difficult child behavior evokes poorer parenting in vulnerable mothers. The literature has established numerous links between difficult child behavior and poor parenting practices that support transactional models of dyadic interactions shaping the behavior of children as well as parents (Sameroff, 2009; Scaramella & Leve, 2004). A review of the relationship between child temperament and parenting provides evidence for several significant effects of child behaviors on parenting during the preschool period, such as child difficult behavior evoking maternal rejection, and associations between child negativity and parental punishment (Kiff, Lengua, & Zalewski, 2011). However, many studies are not designed to adequately examine the potential mechanisms by which specific child behaviors may evoke unique parenting behaviors. Maternal emotion dysregulation has been proposed as a critical component to parenting, with associations found between poor maternal emotion regulation and risk of child maltreatment (Crandall, Deater-Deckard, & Riley, 2015). The findings of the current study suggest that the inability to adequately regulate one's emotions in the context of aversive parenting situations (e.g., interacting with a difficult child) may overwhelm mothers'

capacity to respond appropriately to difficult child behaviors, resulting in parenting that is negative, rejecting, or invalidating.

While the present study is novel in testing the specific model of maternal emotion dysregulation as a moderator between difficult child behavior and poor parenting, there is evidence from other research that in the context of stressful parenting factors (e.g., the stress of parenting a difficult child), mothers who report higher emotion dysregulation have greater difficulty regulating their emotions in the parenting context, resulting in poorer parenting behaviors. Results of a study that examined associations between family stress, emotion regulation, and parent-child interactions in mothers of similarly aged children to those in the present study (3- to 7-years old) provides support for this (Deater-Deckard, Li, & Bell, 2015). In this study, higher levels of chronic family stress (including child behavioral problems as measured by the Strengths and Difficulties Questionnaire (Goodman, 2001)) were associated with mothers' observed negative affect during interaction with their children, which was measured using the same block building task utilized by the current study to measure maternal negativity. This relationship between maternal stress and negative affect was only observed in mothers who reported higher levels of emotion dysregulation. These findings suggest that mothers who are higher in emotion dysregulation may become more emotionally dysregulated in the face of stressful parenting situations when interacting with their preschoolers, resulting in poor parenting behaviors.

As with the nonsignificant findings of Aim 1 regarding child noncompliance and child emotion dysregulation, it is possible that the nonsignificant findings for moderation models including these variables is a function of either maternal reporter bias (e.g., overreporting child internalizing/externalizing behaviors) or laboratory tasks failing to evoke levels of

noncompliance and emotion dysregulation that are representative of what the child typically displays in a more naturalistic environment. Similarly, it is possible that the significant findings for observational measures of parenting but not self-reported parenting may be related to maternal reporter bias. Methodological issues have been raised regarding the use of self-report measures of parenting and it has been suggested that observational measures may yield a more accurate depiction of parenting behaviors than parent self-report (Morsbach & Prinz, 2006). These issues may be more pronounced in mothers who struggle with emotion dysregulation as higher levels of emotional arousal during events have been shown to influence the encoding and subsequent accuracy of memories (Dolcos, Denkova, & Dolcos, 2012). Mothers who experience more emotion dysregulation in the context of parenting may have less accurate memory for engaging in specific negative parenting behaviors, and therefore may have reported themselves as being more supportive on the CCNES than reflects their actual parenting practices. However, there is evidence that mothers with comorbid post-traumatic stress disorder and depression, disorders which are both marked by emotion regulatory difficulties, may actually perceive and report their parenting as more negative than it is observed to be (Muzik et al., 2017). Given the conflicting evidence on maternal bias in reporting, it is unclear whether mothers who struggle with emotion dysregulation would be more prone to report on their parenting, as well as their child's behavior, with a negative or a positive bias, and whether this may have impacted results of the current study.

Clinical Implications

Results of the current study provide empirical support for the role of maternal emotion regulation as a key component of parenting, as well as a factor that may predict child behavior problems. The potential for maternal emotion dysregulation to lead to poorer parenting practices

is of clinical importance given the established link between poor parenting and negative child outcomes. Negative parenting in the form of parental criticism and rejection (Mills et al., 2012) and negative affect (Kerns, Pincus, McLaughlin, & Comer, 2017) has been linked to subsequent child internalizing problems, while unsupportive parenting has been linked to child emotion dysregulation both unidirectionally (Eisenberg et al., 1999) and in a bidirectional relationship (Morelen & Suveg, 2012). The findings that maternal emotion dysregulation is more strongly related to poor parenting in the context of child behavioral problems highlights the importance of maternal emotion dysregulation as an intervention target. This underscores Maliken and Katz' (2013) comments on the importance of focusing on improving parental emotion regulation in parenting interventions as it has been demonstrated that existing parenting interventions do not adequately serve parents who struggle with emotion dysregulation. As parental emotion dysregulation has been linked to less receptiveness to parenting interventions (Assemany & McIntosh, 2002), it may be necessary to increase parents' ability to cope with their own distressing emotions in order to facilitate engagement in learning effective parenting strategies. There is evidence that parenting programs that target the emotion regulation of parents are effective not only in decreasing parental emotion dysregulation, but also reducing child internalizing and externalizing behavior and overall family conflict in families of adolescents (Havighurst, Kehoe, & Harley, 2015; Kehoe, Havighurst, & Harley, 2014) as well as child behavior problems in preschool-aged children (Havighurst et al., 2013)

There is preliminary evidence for the effectiveness of Dialectical Behavior Therapy (DBT; Linehan, 1993) as an intervention for parents with difficulties in emotion regulation. DBT was developed to treat individuals who struggle with severe emotion dysregulation, and the skills group component of DBT has been shown to be effective in treating a variety of forms of

psychopathology, as well as emotion dysregulation specifically (Neacsiu, Eberle, Kramer, Wiesmann, & Linehan, 2014). A recent case study was the first to examine the use of DBT skills group in parents who struggle with severe emotion dysregulation (Martin, Roos, Zalewski, & Cummins, 2017). Participants included four mothers who participated in weekly group sessions over the course of 22-weeks, all of whom reported severe emotion dysregulation and met criteria for at least one form of Axis I psychopathology. After treatment, exit interviews were conducted with two of the mothers, who reported using DBT skills in a variety of parenting contexts, such as regulating their emotions in the presence of their child, helping their child to regulate their own emotions, and engaging more effectively in parent-child interactions, including increased competency when disciplining their child. At posttreatment, all four mothers reported reduced emotion dysregulation, as well as improvements in their parenting (e.g., increased supportiveness, less psychological control and lax discipline) as a result of treatment.

In addition to increasing the effectiveness of parenting interventions, it is important to consider the implications for individual therapy and treating adult clients who are parents. A recent review of clinical considerations for mental health practitioners who see adult clients provides recommendations for modifying practice to more effectively serve parents (Zalewski, Goodman, Cole, & McLaughlin, 2017). These include screening parenting quality and the client's role as a parent (e.g., assessing for parenting stress and other factors to determine the extent to which parenting may be contributing to mental health symptoms), screening children's well-being (e.g., assessing for possible difficulties in emotional or behavioral functioning that may inform referral decisions), providing online resources for parenting (such as parenting tips and strategies for communicating appropriately with one's child about mental health symptoms), and guidelines for making decisions about referral options for further care (e.g., child or family

therapy, or parenting interventions). Additionally, providing greater psychoeducation to parents about the role of parental emotion dysregulation and parenting stress in the development of child behavior problems as a rationale for focusing on improving their emotion regulation skills may be helpful in both individual and parenting-based interventions.

Finally, study findings highlight the necessity of assessing for and addressing parenting stress in interventions, whether parenting-based or individual. Despite the capacity for parenting stress to increase maternal emotion dysregulation, there is evidence that higher levels of parenting stress may be associated with greater parental readiness to change in clinically referred families, regardless of problem behavior severity (Jones, Putt, Rabinovitch, Hubbard, & Snipes, 2017). For mothers who are struggling with higher levels of emotion dysregulation, the potential to decrease aversive parenting stress may provide motivation for therapeutic change. DBT skills may be an effective approach to decrease parenting stress as all participants in the DBT case study reported decreased levels of parenting stress at posttreatment (Martin, Roos, Zalewski, & Cummins, 2017). It has also been recommended that practitioners who are treating parents specifically address parenting stress while treating comorbid symptoms of parental psychopathology, as various clinical presentations may impact what aspects are most salient in mothers' experience of parenting stress. For example, there is evidence that mothers with psychopathology that is marked by severe emotion dysregulation may be more likely to experience parenting stress related to inadequate social support as well as how they perceive their child (Ramsauer, Muhlhan, Mueller, & Schulte-Markwort, 2016).

Study Strengths

The current study provides several contributions to the literature on the relationship between maternal psychopathology and child behavior, the effects of parenting stress, and factors

that influence parenting. 1. A primary strength of this study is its utilization of cross-lagged path models to examine child effects on maternal emotion dysregulation. As much of the literature has examined the reverse relationship (e.g., the effect of maternal psychopathology on child outcomes), this study contributes to a small but growing literature on bidirectional relationships between parents' and children's mental health symptoms.

The second distinction of the current study is its 2. focus on maternal emotion dysregulation. While there is a substantial literature that has established the impact of maternal depression on parenting (Lovejoy, Graczyk, O'Hare, & Neuman, 2000) and negative child outcomes (Goodman et al., 2011), comparably little research has focused on the transdiagnostic feature of emotion dysregulation and its relationship to both parent and child outcomes, despite numerous calls for this construct as an important direction for future research (Rutherford, Wallace, Laurent, & Mayes, 2015; Dix, 1991). The current study is among the first to examine maternal emotion dysregulation as a predictor of children's emotional and behavioral problems, as well as the way in which child behavior and maternal emotion dysregulation may interact to predict poorer parenting.

This study is also strengthened by its 3. longitudinal design, which allows for the examination of bidirectional effects over time, an approach which is underutilized in the literature (Pardini, 2008). While a number of studies have found associations between child behavior and parenting, the predominant cross-sectional design in this literature limits the conclusions that can be drawn in regard to the direction of influence (Kiff, Lengua, & Zalewski, 2011). The inclusion of two time points in this study allows for the examination of how parent and child factors influence each other over the course of two years.

Another strength of this study is the utilization of a 4. multimethod approach, which uses both mother-report and observational measures of child behavior and parenting. The problem of shared reporter variance, in which the degree of association between the independent and dependent variable may be inflated by the use of a single reporter (e.g., the parent) for both measures, has been cited as a form of method bias to be addressed in behavioral research (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In employing a multimethod approach which obtains reports from two different sources (e.g., parent and observation), the current study is able to partially protect against this bias.

Limitations

This study also has several limitations to be considered when interpreting study results as well as designing future research on related topics. One limitation is that the study was not designed to account for heritability factors, so it is impossible to determine the extent to which relationships between parent and child symptoms may have resulted from genetic versus environmental factors. It is likely that the developmental trajectory of child behavioral problems is influenced by both heritability and parenting factors, as is evidenced by research on the transmission of psychopathology to children of parents who are higher in emotion dysregulation (White et al., 2003) as well as the established role of genetic factors in the development of child internalizing and externalizing disorders (Franic, Middeldorp, Dolan, Ligthart, & Boomsma, 2010; Hicks, Krueger, Iacono, McGue, & Patrick, 2004)

This study is also limited by its modest sample size of 40 mother-child dyads at the second time point, which may have limited the power to detect small effects. This could possibly account for the failure of certain findings to reach significance, such as the trending relationship

between parenting stress at when children are 3-4 years old and maternal emotion dysregulation when children are 5-6 years old.

Third, this study may be limited by the fair level of agreement for observational coding of child noncompliance and maternal negativity at time 2. Although all other observational codes achieved good to excellent interrater reliability, the relatively lower levels of interrater agreement for these variables must be taken into consideration when interpreting study findings.

Another limitation of the current study is its inclusion of only mothers, which precludes the ability to examine the contributions of fathers to child behavioral outcomes. There is evidence that, within the family, fathers engage in emotion socialization practices that may differ from those of mothers (Shortt et al., 2016; Wong, McElwain, & Halberstadt, 2009) and could have a differential impact on the way children learn to regulate their emotions. It is unclear to what extent father factors (e.g., parenting practices, emotion dysregulation) may have impacted subsequent child outcomes in this sample.

A final limitation of this study is the lack of additional informant reports, such as teachers, on child behavior. While a strength of this study was the utilization of both mother-report and observational measures of child behavior, the discrepant findings related to these different methods raise questions regarding the accuracy of mother-reported child behavior as well as the consistency of child behavior across contexts. While child behavior may be different at school (or in a laboratory) than in the home, it has also been suggested that parenting stress may lead to response bias and discrepancies in parent and child ratings of psychopathology, though evidence of parental response bias is mixed (De Los Reyes & Kazdin, 2005). Although children in the current study were too young to provide a self-report of behavioral problems, it is possible that maternal emotion dysregulation and/or parenting stress may have led to

discrepancies between mother-reported and observed child behavior. Without additional informant reports, the current study was unable to evaluate child behavior in other contexts outside of the home or further examine the potential source of discrepancy between measurements approaches.

Future Directions

Findings of the current study provide support for maternal emotion dysregulation as a predictor of child internalizing and externalizing behavior. Further studies are warranted to replicate these findings, and to examine the effect of maternal emotion dysregulation on other child emotional and behavioral problems over time. To date, few longitudinal studies have examined the effect of maternal emotion dysregulation on the development of child behavioral problems (Crandall, Ghazarian, Day, & Riley, 2016) and several of the existing studies examine these relationships in the context of maternal borderline personality disorder and offspring who are adolescents (Barnow et al., 2013; Reinelt et al., 2013). Future studies are needed to broaden the scope of research on this topic to include mothers who may be experiencing sub-clinical levels of emotion dysregulation, as well as children during earlier developmental stages.

Findings of the current study also provide evidence for the critical role of maternal emotion dysregulation as a predictor of parenting quality. This is another important direction for future research as few studies have examined longitudinal associations between maternal emotion dysregulation and parenting practices (Laulik, Allam, & Browne, 2016; Zalewski et al., 2014; Schuppert, Albers, Minderaa, Emmelkamp, & Nauta, 2012).

While results of this study did not support the hypothesized child effects on maternal emotion dysregulation, future research which includes a greater number of time points (e.g., three or more) would provide an opportunity for more rigorous examination of bidirectional

associations (Kiff, Lengua, & Zalewski, 2011). As discussed earlier, there may have been an effect of child developmental stage in this sample such that maternal effects exerted the greatest influence. Longitudinal research with an increased time span for analyses is needed to examine bidirectional effects from the preschool period through adolescence. Adolescence may be a particularly challenging time for mothers in which child effects could become more prominent. Mothers may struggle with responding to normative adolescent behaviors, such as individuation and autonomy seeking, which have been reported as difficult to adjust to by parents (Silverberg & Steinberg 1990). Adolescence is also a key time period for the onset of psychopathology (Merikangas, Nakamura, & Kessler, 2009), and coping with this increase in child emotional or behavioral problems has the potential to evoke emotion dysregulation in mothers.

Research on these topics would benefit from the use multiple of informants of child behavior as well as parenting practices. Incorporating reports of child behavior and parenting from both parents (when possible) may provide a more detailed assessment of these constructs and protect against the effect of single-reporter bias. Additionally, future studies may be improved by the use of teacher reports of child behavior. While it is generally recommended that multiple informants provide ratings of child behavior for a thorough assessment, this introduces additional methodological issues, such as decision making regarding informant discrepancies (Volpe & DuPaul, 2001).

Lastly, future research should include fathers when possible, in order to examine their role in influencing both child behavior and maternal emotion dysregulation. The underrepresentation of fathers as participants in studies of child development has been well-documented (Mitchell et al., 2010; Phares, Fields, Kamboukos, & Lopez, 2005; Phares, 1992), despite the fact that fathers have been shown to have significant effects on their child's

emotional development leading up to and during the preschool period (Cabrera, Shannon, & Tamis-LeMonda, 2007). Future research should also examine the quality of mothers' relationships with the father or other romantic partner, when applicable. It has been demonstrated that marital satisfaction and relationship quality impact the mental health of mothers as well as their children (Hannighofer, Foran, Hahlweg, Zimmermann, 2017). There is also evidence that marital stress impacts mothers and fathers differently, and may have a greater effect on fathers' parenting than on mothers' parenting (Elam, Chassin, Eisenberg, Spinrad, 2017; Coiro & Emery, 1998). Research that includes fathers as well as assessments of marital or romantic relationships has the potential to elucidate further mechanisms by which parental mental health influences child behavior, or parenting, as well as identify potential protective factors or risk factors for the development and maintenance of psychopathology.

Conclusion

The current study makes several contributions to the literature. Findings of this study provide empirical evidence for the role of maternal emotion regulation as a critical aspect of parenting, supporting several calls in the literature for increased investigation of this construct (Rutherford et al., 2015; Dix, 1991). In examining the transdiagnostic feature of maternal emotion dysregulation, this study expands upon research that has established links between maternal depression and parenting (Lovejoy et al., 2000) as well as negative child outcomes (Goodman et al., 2011). Mothers' self-reported emotion dysregulation was significantly associated with higher levels of children's internalizing and externalizing behaviors two years later. Mothers of children who were higher in internalizing and externalizing behaviors, and who reported higher levels of emotion dysregulation, were observed to demonstrate greater maternal negativity during interactions with their child two years later. The discrepancy between the

findings of the current study, which supported parent effects on child behavior, and models that suggest bidirectional effects of parent and child behavior (Sameroff & MacKenzie, 2003) points to the need for future longitudinal research that may delineate the differential influence of parents and children during various developmental stages. The current study also advances our understanding of the relationship between parenting stress and maternal mental health, suggesting that higher levels of parenting stress may be predictive of increased maternal emotion dysregulation.

Overall, these findings a) suggest that maternal emotion dysregulation may predict child internalizing and externalizing behaviors, as well as negative parenting practices, b) emphasize the role of parenting stress as a predictor of maternal emotion dysregulation, and c) highlight the need for interventions that target maternal emotion dysregulation and effectively reduce parenting stress.

APPENDIX: FIGURES AND TABLES

Table 1. List of Study Measures, Means and Mean-level Changes, Standard Deviations, and Alphas at Times 1 and 2

Construct	Measure	Time 1	Time 2	Changes from Time 1 to Time 2
<i>Maternal Emotion Dysregulation</i>	Difficulties in Emotion Regulation Scale	$M = 66.86$ $SD = 21.89$ $\alpha = .87$	$M = 61.40$ $SD = 16.49$ $\alpha = .70$	$t = 2.50, p = .017$
<i>Parenting Stress</i>	Parenting Stress Scale	$M = 38.13$ $SD = 11.52$ $\alpha = .56$	$M = 36.65$ $SD = 1.85$ $\alpha = .69$	$t = 1.29, p = .206$
<i>Parenting Behaviors</i>				
Supportiveness of Child Emotions	Coping with Children's Negative Emotions Scale	$M = 16.96$ $SD = 2.64$ $\alpha = .92$	$M = 20.37$ $SD = 2.49$ $\alpha = .93$	$t = -9.61, p = .000$
Negativity, Rejection, & Invalidation	Lego Task (Parent-Child Interactions Observational Coding Manual)	$M = .21$ $SD = .47$ $\kappa = .79$	$M = .10,$ $SD = .24$ $\kappa = .51$	$t = 1.20, p = .239$
<i>Child Psychopathology</i>				
Internalizing Symptoms	Child Behavior Checklist	$M = 11.28$ $SD = 8.77$ $\alpha = .88$	$M = 10.74$ $SD = 7.05$ $\alpha = .84$	$t = .60, p = .55$
Externalizing Symptoms	Child Behavior Checklist	$M = 13.60$ $SD = 9.26$ $\alpha = .93$	$M = 12.58$ $SD = 10.33$ $\alpha = .95$	$t = 1.08, p = .28$
Emotion Dysregulation	Locked Box Task	$M = 5.20$ $SD = 3.09$	$M = 2.20$ $SD = 3.00,$	$t = 5.28, p = .000$

		$\kappa = .79$	$\kappa = .62$	
Compliance	Lego Task (Parent-Child Interactions	$M = 4.02$ $SD = 1.17$	$M = 4.65$ $SD = .48$	$t = -3.22, p = .003$
	Observational Coding Manual)	$\kappa = .97$	$\kappa = .59$	

Table 2. Coded Child Emotional Expressions

	<u>Time 1</u>			<u>Time 2</u>		
	M	SD	Observed Range	M	SD	Observed Range
Sad	1.92	1.82	0-7	.70	1.76	0-4
Angry	2.79	2.47	0-8	1.43	1.43	0-10
Anxious	.47	1.56	0-4	.25	.25	0-4
Composite	5.18	3.10	0-11	2.42	3.22	0-11

Table 3. Bivariate Correlations Among All Key Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Gender	1	0.007	-0.150	-0.190	-0.116	-.317*	0.130	0.081	0.098	0.059	-0.075	-0.238	-0.089	-0.125	0.196	-0.036	0.005	-0.171
2. Family income	-	1	-0.149	-.416*	-.413*	-.445*	0.125	.411*	0.002	-0.234	-.391*	-0.268	-0.170	-0.100	-0.113	0.059	-0.286	-0.291
3. Int. T1			1	.467*	.681*	.587*	-.441*	-0.170	0.127	-0.059	.595*	.545*	.539*	.532*	-0.311	-0.274	-0.181	.576*
4. Int. T2				1	.546*	.789*	-0.273	-0.193	0.053	0.234	.570*	.698*	.350*	.518*	-0.165	-0.322*	0.149	.385*
5. Ext. T1					1	.682*	-0.263	-0.328	0.072	0.261	.578*	.401*	.485*	.468*	-0.057	-0.193	0.026	.590*
6. Ext. T2						1	-.332*	-.408*	0.145	0.270	.678*	.698*	.560*	.694*	-0.244	-0.376*	0.101	.530*
7. Comp. T1							1	0.251	-0.034	-0.060	-0.251	-0.232	-0.238	-0.198	.317*	0.029	0.118	0.120
8. Comp. T2								1	-0.049	-0.076	-0.070	-0.098	-0.022	-0.052	0.026	0.133	0.132	-0.240
9. Child Emo. Dysreg. T1									1	.390*	0.044	0.127	0.013	0.177	0.154	0.045	0.160	0.038
10. Child Emo. Dysreg. T2										1	-0.082	-0.131	-0.046	-0.004	.441*	0.283	.482*	-0.221

11. Mat. Emo. Dysreg. T1											1	.775*	.753*	.643*	-.516*	-.592*	-.091	.578*
12. Mat. Emo. Dysreg. T2												1	.485*	.590*	-.463*	-.489*	0.003	.458*
13. Parenting Stress T1													1	.805*	-.472*	-.558*	-.0272	.344*
14. Parenting Stress T2														1	-.427*	-.621*	-.0044	.420*
15. Supp. T1															1	.626*	.338*	-.381*
16. Supp. T2																1	0.216	-.399*
17. Neg. T1																	1	-.0134
18. Neg. T2																		1

***p<.001; **p<.01; * p<.05

Abbreviations: Int.= Internalizing; Ext.=Externalizing, Comp.= Compliance, Emo. Dysreg. = Emotion Dysregulation, Mat. Emo. Dysreg. = Maternal Emotion Dysregulation, Supp. = Supportiveness, Neg. = Negativity.

Table 4. Results of eight moderation tests predicting maternal negativity and supportiveness at time 2. Unstandardized (*b*), standard errors (*SE*), and standardized coefficients (β) are presented.

	<u>Maternal Negativity</u>			<u>Maternal Supportiveness</u>		
	<u><i>b</i></u>	<u><i>SE</i></u>	<u>β</u>	<u><i>b</i></u>	<u><i>SE</i></u>	<u>β</u>
Test 1 & 2						
Child Gender	-.04	.06	.22	-.47	.70	-.09
Family Income	-.01	.03	-.06	-.50	.33	-.23
Maternal Emotion Dysregulation	.00	.00	.27	-.08	.02	-.73
Child Internalizing	.01	.01	.22	.06	.06	.19
Maternal Emotion Dysregulation x Child Internalizing	.00	.00	.42	-.00	.00	-.17
Test 3 & 4						
Child Gender	-.05	.06	-.10	-.35	.69	-.07
Family Income	-.01	.03	-.02	-.35	.35	-.16
Maternal Emotion Dysregulation	.00	.00	.27	-.08	.02	-.72
Child Externalizing	.01	.00	.28	.05	.05	.19
Maternal Emotion Dysregulation x Child Externalizing	.00	.00	.32	-.00	.00	-.11

Test 5 & 6						
Child Gender	-.08	.07	-.16	-.30	.68	-.06
Family Income	-.01	.03	-.05	-.46	.33	-.21
Maternal Emotion Dysregulation	.01	.00	.56	-.08	.02	-.69
Child Compliance	.04	.04	.17	-.16	.29	-.08
Maternal Emotion Dysregulation x Child Compliance	.00	.00	.16	-.00	.02	-.05
Test 7 & 8						
Child Gender	-.70	.07	-.14	-.28	.70	-.10
Family Income	-.04	.04	-.20	-.53	.37	-.25
Maternal Emotion Dysregulation	.01	.00	.51	-.08	.02	-.69
Child Emotion Dysregulation	.01	.01	.07	.08	.12	.10
Maternal Emotion Dysregulation x Child Emotion Dysregulation	.00	.00	.25	.00	.01	.09
Bolded = $p < .00625$ (computed as $.05/8$ tests)						

Table 5. Summary of Study Results

	<u>Hypothesis</u>	<u>Results</u>
<u>Model 1</u>		
H1	Higher levels of difficult child behaviors at T1 will be prospectively associated with increases in maternal emotion dysregulation at T2.	Not supported for any of the four child variables. Maternal emotion dysregulation at T1 was prospectively associated with increases in child internalizing and externalizing behaviors at T2.
<u>Model 2</u>		
H2	There will be higher levels of maternal parenting stress at T1 prospectively associated with maternal emotion dysregulation at T2.	Supported at a trending level.
<u>Model 3</u>		
H3	The association between child problems (at T1) and poorer parenting (at T2) will be exacerbated for mothers with higher levels of emotion dysregulation compared to mothers with lower levels of emotion dysregulation at T1.	Supported for the relationship between child internalizing and externalizing problems and maternal negativity. Not supported for the relationship between child noncompliance or child emotion dysregulation on either parenting variable, or any of the child behavior variables on maternal supportiveness.

Figure 1. Conceptual cross-lagged path model of the relationships between child behavior and maternal emotion dysregulation.

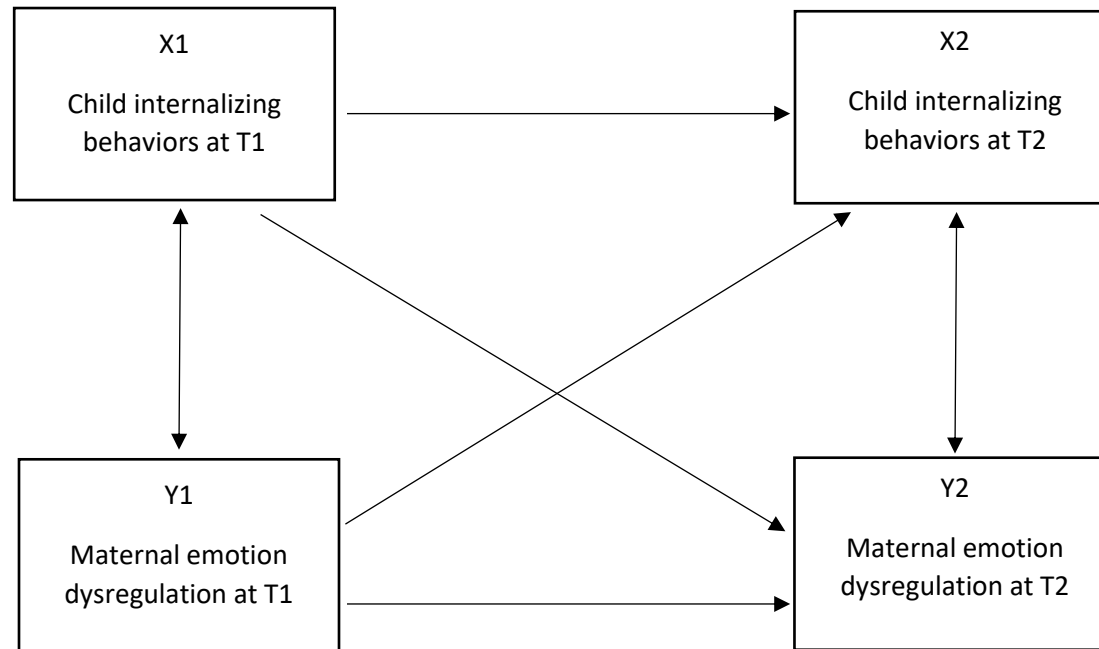


Figure 2. Cross-lagged path model of the relationships between child internalizing problems and maternal emotion dysregulation. Standardized coefficients are provided. Significant relationships are indicated by bold lines.

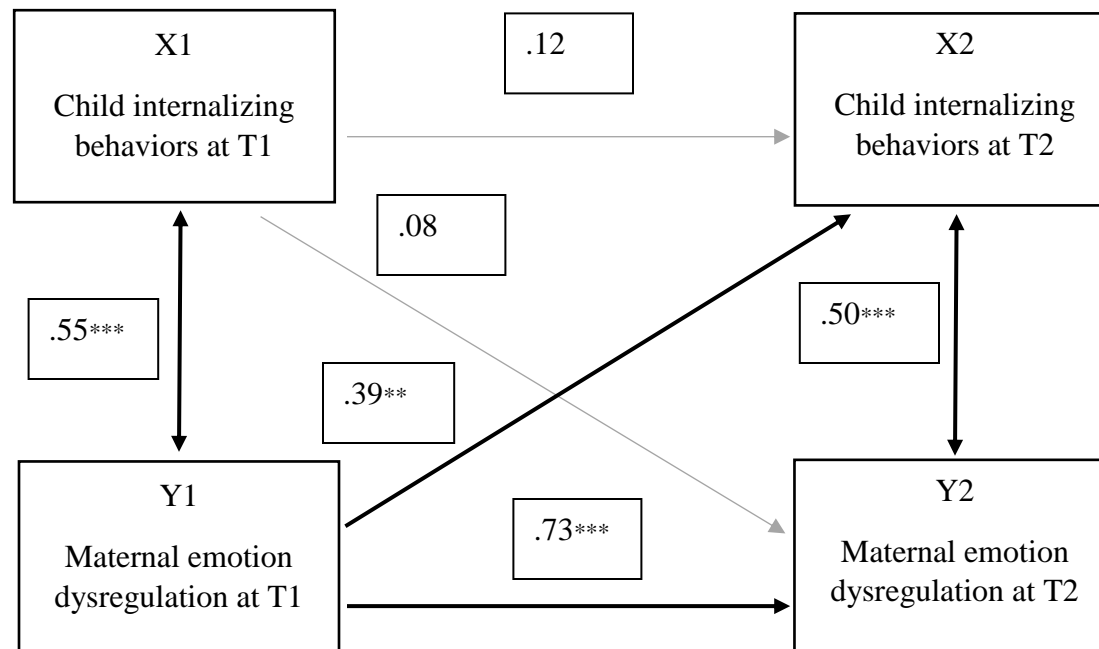


Figure 3. Cross-lagged path model of the relationships between child externalizing problems and maternal emotion dysregulation. Standardized path coefficients

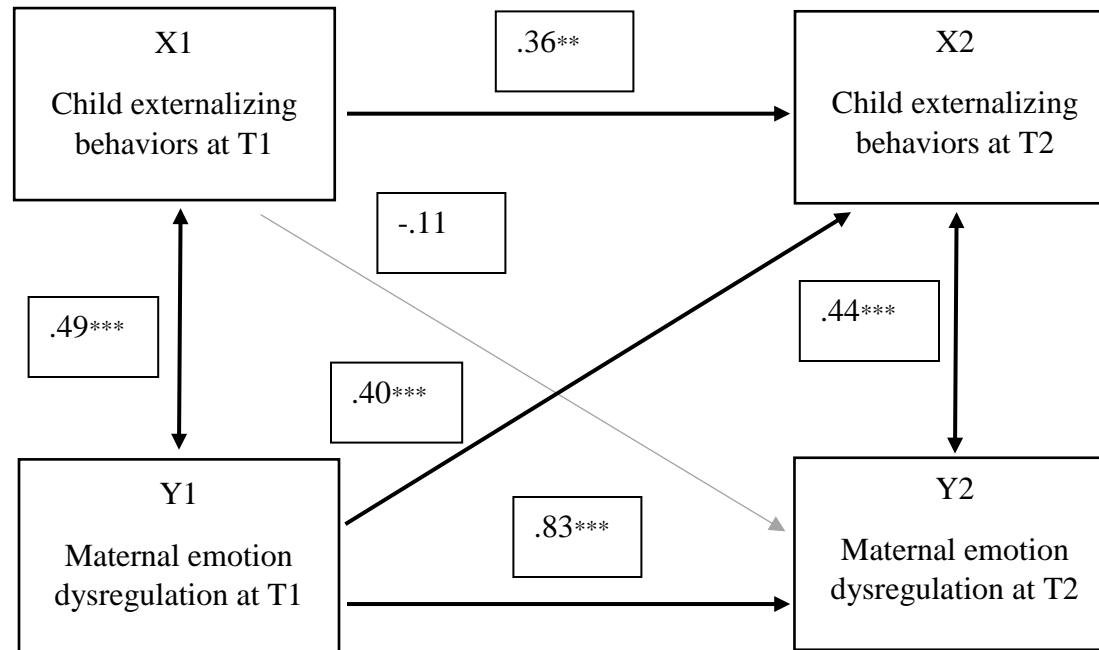


Figure 4. Cross-lagged path model of the relationships between child noncompliance and maternal emotion dysregulation. Standardized path coefficients

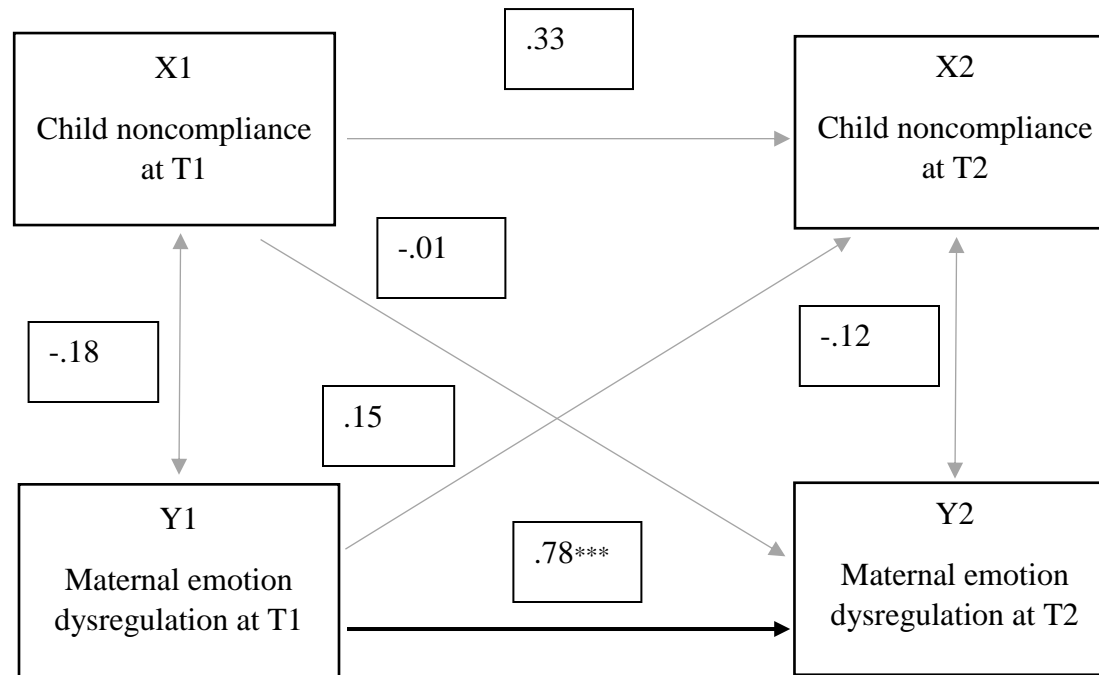


Figure 5. Cross-lagged path model of the relationships between child emotion dysregulation and maternal emotion dysregulation. Standardized path coefficients

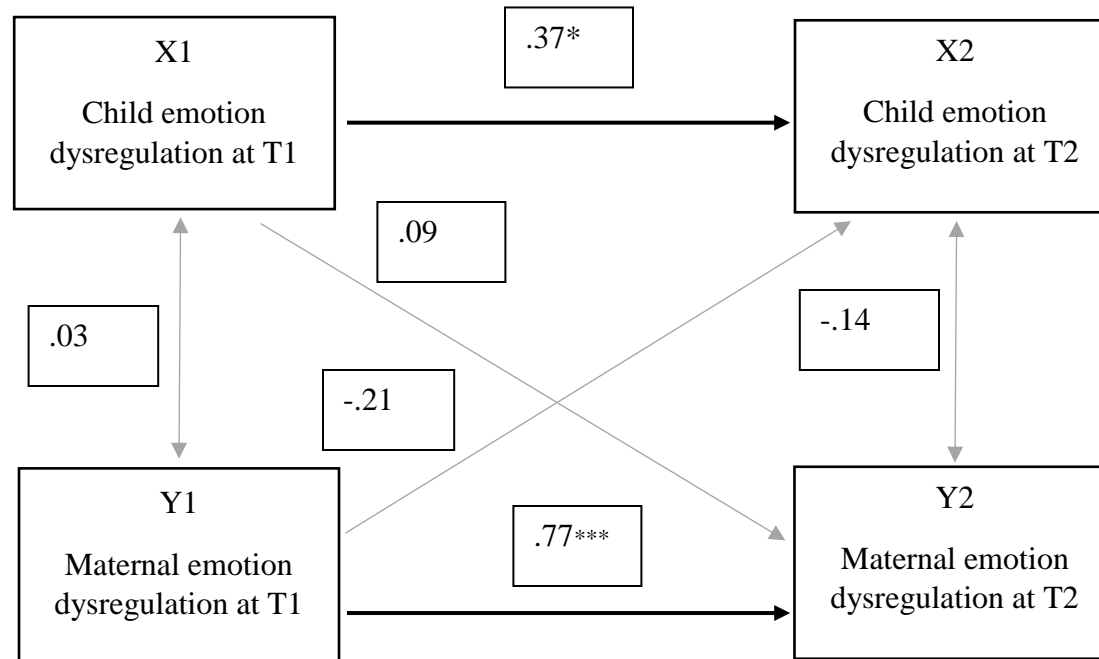


Figure 6. Cross-lagged path model of the relationships between maternal emotion dysregulation and parenting stress. Standardized path coefficients

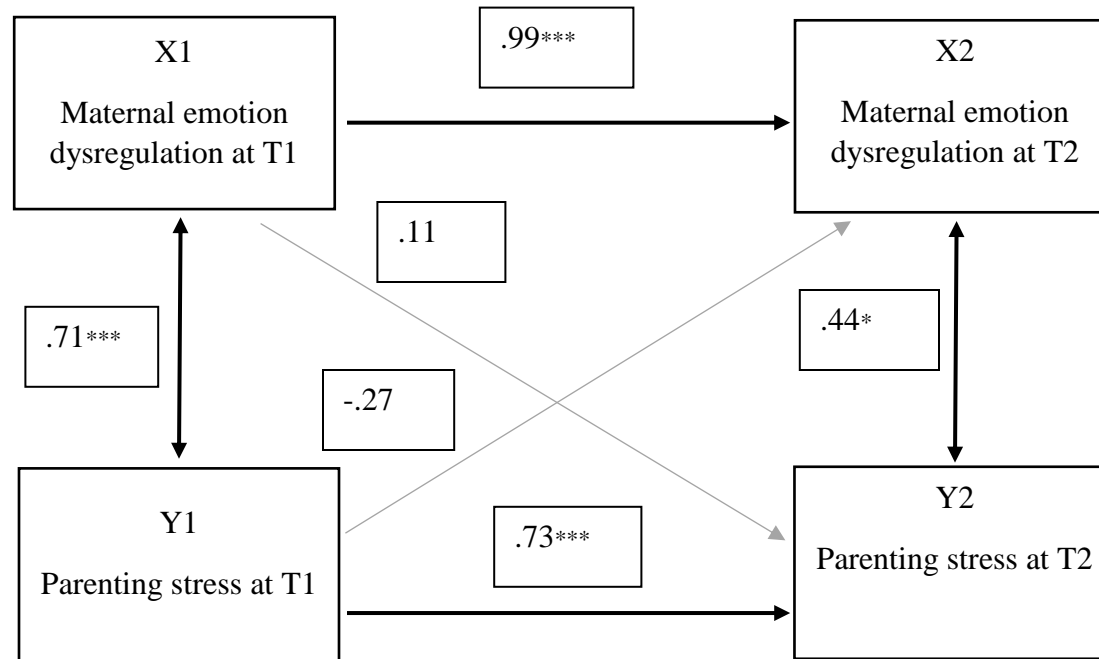


Figure 7. The Moderating Effect of Maternal Emotion Dysregulation on the Relationship between Child Internalizing Behavior and Maternal Negativity.

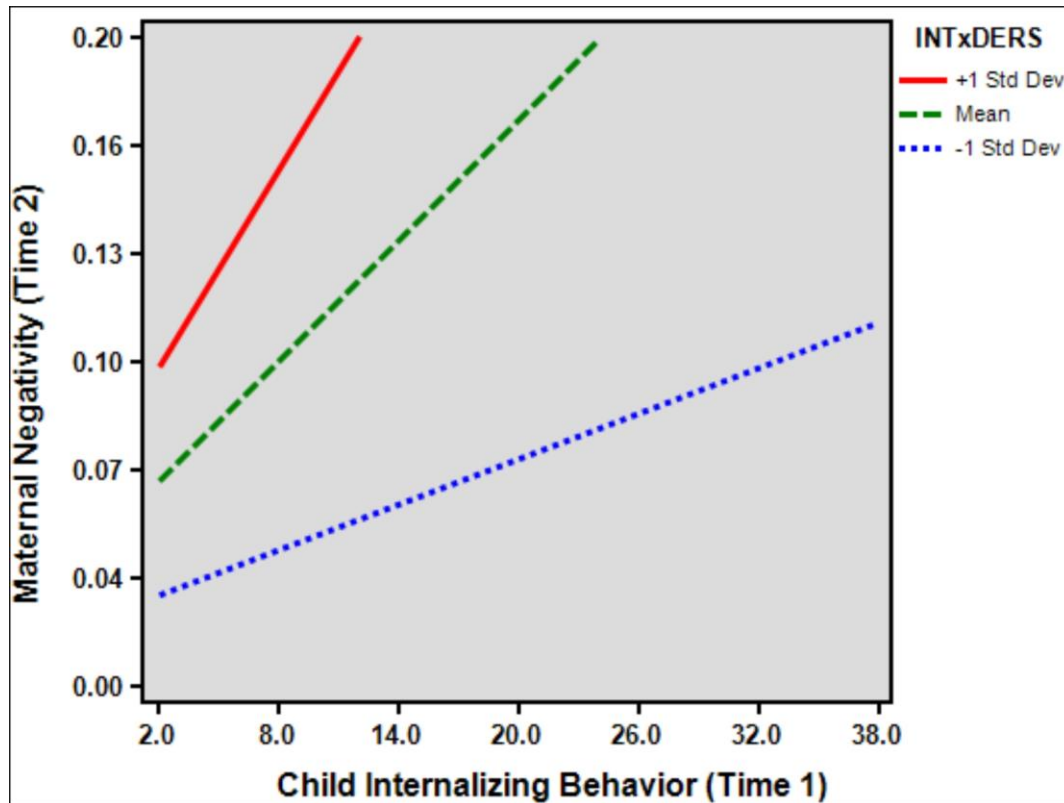
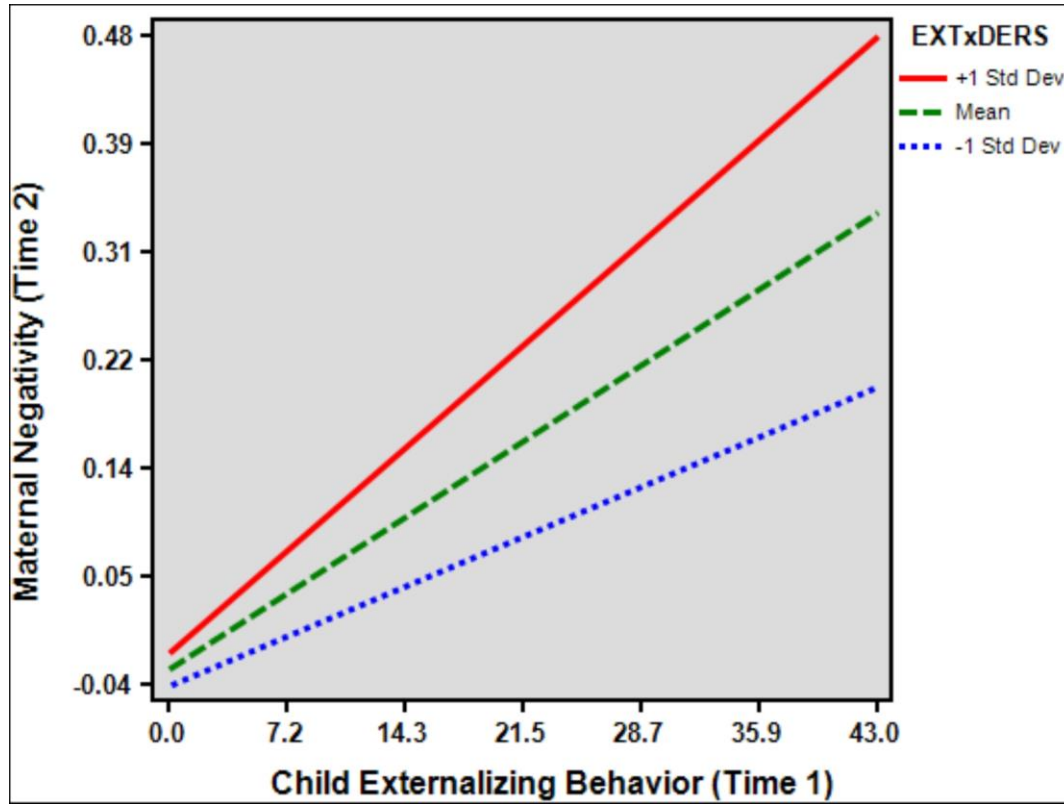


Figure 8. The Moderating Effect of Maternal Emotion Dysregulation on the Relationship between Child Externalizing Behavior and Maternal Negativity.



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