

Maternal Mental Health Symptom Severity, Recent Stress, and their Associations with Parenting
Sensitivity in a Treatment-seeking Sample

by

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Abstract

Parenting sensitivity refers to a caregiver's ability to perceive, accurately interpret, and respond appropriately to the needs of a child. For mothers of infants, managing depression can impact sensitive parenting, which can be complicated further by individual mental health symptoms such as anger and sleep disturbance and by contextual life stressors. However, links between parenting sensitivity and depression are scarce in parents of toddlers and have yet to be studied in online assessment contexts (e.g., over Zoom). This study examined links between the severity of mental health symptoms (i.e., depression, sleep disturbance, and anger) and parenting sensitivity for mothers meeting clinical criterion for depression and/or anxiety. Recent stressful experience was hypothesized to moderate the association between depression and parenting sensitivity. A secondary objective was to successfully adapt and administer an in-person measure of sensitivity to meet remote assessment needs. The current sample included 141 mothers and their 2-to-3-year-old toddlers in a secondary analysis of baseline data from an intervention for mothers with mental health challenges: the Building Emotional Awareness and Mental Health (BEAM) program. The results of this study indicated both depression, sleep, and recent stressors as unique contributors to sensitive parenting. No significant associations were found between anger and sensitive parenting in this sample. A unique contribution is the use of an online-observed parenting sensitivity assessment. A clinical implication includes the consideration of targeted intervention that addresses both parental mental health and parenting skills.

Keywords: parenting sensitivity, mental health, recent stress, online assessment

Maternal Mental Health Symptom Severity, Recent Stress, and their Associations with Parenting Sensitivity in a Treatment-seeking Sample

Parenting sensitivity refers to a caregiver's ability to perceive, accurately interpret, and respond appropriately to the needs of a child (Ainsworth et al., 1978). Sensitivity is key in the development of secure attachment, a predictor for positive child outcomes in social, intellectual, and cognitive development (Bernard et al., 2018; Booth et al., 2018; Verhage et al., 2016). Insensitive parenting practices such as invalidation and harsh discipline are established pathways to negative child mental health outcomes (Morris et al., 2017; Sperlich & Seng, 2018). Through emotional socialization behaviours like the expression of parent emotions and reaction to children's emotions, parents indirectly teach children how to process, express, and regulation their own emotions (Eisenburg et al., 1998). Sensitive parenting has been established in the literature as a common challenge for mothers with depression, pointing to the emotion dysregulation feature of mood disorders as particularly interfering with sensitive parenting (Bernard et al., 2018; Haga et al., 2012). Further, sleep disturbance poses challenges for sensitive parenting due to parental difficulty in emotion processing and cognitive functioning, often leading to increased overreactive or harsh parenting (Harrison & Horne, 2000; McQuillan et al., 2019).¹ Therefore, multiple factors may impact a mother's capacity to exhibit high sensitivity in

¹ **Anxiety & Sensitivity.** Although anxiety can be debilitating for maternal well-being, extant reviews indicate that anxiety does not have a large impact on sensitivity at the toddler ages and is therefore not a focus of the present study (Kertz et al., 2008; Rifkin-Graboi et al., 2015). Emotion dysregulation in this study also excluded symptoms of anxiety due to maternal depression having the strongest effect sizes with insensitive parenting through the low mood and anhedonia pathways (Grant et al., 2010; Kertz et al., 2008). Maternal anxiety was collected due to its relevance to other variables collected in an RCT, from which these data were pulled.

their parenting behaviours, including current mental health status. However, while associations between mental health and sensitive parenting have been established, there is a gap in the literature regarding how different mental health factors (depressed mood, sleep disturbances, and anger issues) differentially predicts parenting sensitivity.

Despite evidence that exposure to maternal mental health symptoms in the toddler years (ages 2-3) is strongly linked to children's emotional and behavioural problems, most of the parenting sensitivity research to date is focused on infancy due to its role in early attachment literature (Deans 2020; Mesman & Emmen, 2013; Oztop & Uslu, 2007). Furthermore, there is a need to assess links between maternal characteristics and sensitivity from online assessments, given the changes to online research and novel parenting challenges since the COVID-19 pandemic (Sy et al., 2020; Whaley & Pfefferbaum, 2023). Traditionally, the assessment of parenting sensitivity occurred during at-home observation, which often places geographic limitations on sample recruitment (Mesman & Emmen, 2013). A few studies assessing the parenting skills of parents with toddlers or young children online have demonstrated excellent interrater and test-retest reliability, indicating a meaningful shift in traditional methodology (Oliver & Pike, 2019; Waller et al., 2024). The transition of assessment into online spaces will likely continue to lower barriers to accessing mental health services (Khoury et al., 2023).

The current study seeks to build on literature linking maternal mental health symptoms (i.e., depression, anger, and sleep deprivation) to parenting sensitivity using online assessment of parent-child interactions. Extant studies have provided support for the centrality of current adult mental health conditions to their parenting practices (Deans, 2020). This study seeks to simultaneously analyze three broad categories of mental health symptoms relevant to the ability to parent sensitively for mothers meeting clinical cut-off for depression and/or anxiety.

Examining parenting sensitivity and associations with current mental health symptoms of depression, anger, and sleep disturbances, may help inform future assessments and targeted interventions pertaining to parenting and maternal mental health.

Key Definitions

Parenting sensitivity. This construct refers to the accurate perception and interpretation of a child's signals, non-intrusive and timely response of the mother to improve child comfort, developmentally appropriate scaffolding to ensure rewarding experiences, and consistent emotional availability/support (Nicholls & Kirkland, 1996). Recent revisions to the construct stresses that parenting sensitivity involves reciprocal exchanges between mother and child, provides a safe environment for infant exploration, and features synchrony between mother-child behaviours (Shin et al., 2008).

Emotion Dysregulation. Emotion regulation refers to the effortful control of one's emotions through strategies such as reappraisal, and adaptive cognitive reframing of one's emotional experiences (Gross, 2013). Emotion dysregulation refers to a lack of such regulation skills and an elevation in negative emotional experiences (Turk et al., 2005). Depression can be conceptualized as an emotion regulation disorder: characterized by prolonged periods of low mood (sadness), an inability to find pleasure in previous interests (anhedonia), and emotional processing fixated on negative stimuli (Plewnia et al., 2015; Sanchez-Navarro et al., 2014). In mothers of toddlers, these symptoms may present as a lower interest in child engagement, harsh or overreactive responses to child misbehaviour, and limited responsiveness or communication with the child (Feng et al., 2007; Pemberton et al., 2010). For the scope of this study, emotion dysregulation is defined to include depression symptoms (i.e., low mood, anhedonia, and fixation on negative stimuli) in a cohort of mothers seeking mental health support for clinically

significant depression and/or anxiety symptoms. Sleep disturbance is often characterized as a symptom of depression, while depression and maternal anger both feature the dysregulated expression of irritability, which increases the risk of harsh parenting practices (Steffgen et al., 2022).

Theoretical Models

Intergenerational Transmission of Emotion & Behavioural Self-regulation.

Experiences during childhood, especially involving one's primary caregivers, inform our patterns of behaviour and set the ground for the direction of future relationships (Bridgett et al., 2011). Child and maternal executive functioning have been found to demonstrate positive associations longitudinally (Cuevas et al., 2014; Bridgett et al., 2011; Jester et al., 2009). Similar results have been observed for low parent impulsivity and higher child inhibitory control (Verhoeven et al., 2007). Positive associations between maternal and child physiological indicators of emotional self-regulation, such as vagal tone (the amplitude and oscillations associated with inhalation and exhalation), have been observed for toddlers, adolescents, and children longitudinally (Bornstein & Suess, 2000; Buckholdt et al., 2013; Kim et al., 2009; Sarıtaş & Gençöz, 2012). A possible explanation for this association is the intergenerational transmission of self-regulation through the mechanism of parenting. Intergenerational transmission of self-regulation highlights the gene-environment interaction on child development, setting the foundation for psychosocial outcomes in adulthood, including parenting behaviours that subsequently impact the next generation (Bridgett et al., 2015). For example, longitudinal studies have found that physical discipline of children was related to child aggressive behaviour a year later, but this association only existed for children of mothers with lower parenting sensitivity (Alink et al., 2009).

Social Learning Theory. Similarly, social learning theory highlights that behaviour is learned through the observation of adults during the early years of development (Bandura, 1973). For example, when parents frequently use harsh discipline, children may imitate these behaviours and learn to use aggression as a viable solution to problem-solving (Alink et al., 2009). Applying emotion regulation to social learning theory, children observe the way in which their caregivers express and process emotions, then subsequently learn to regulate their own emotions through learned experience. Direct associations have been found between parental use of physical discipline and child aggression, suggesting that children who received physical discipline learned to display aggressive behaviour in cross-sectional and longitudinal samples (Fine et al., 2004; Knutson et al., 2005).

Relevant to the context of this study, it is expected that mental health symptoms linked to emotion dysregulation (e.g., anger, low mood / anhedonia, sleep problems) will be associated with lower maternal capacity to engage in sensitive parenting behaviours, which is relevant to facilitating child emotional self-regulation (SR) over time. Emotion dysregulation decreases the cognitive and emotional functioning needed for parents to pay attention to their child's emotions and respond in contingency with their behaviours in a way that promotes emotion regulation. For example, a depressed mother with low energy or flattened speech may find it challenging to meet the demands of toddler play (Eisenberg et al., 1998). *Figure 1* provides a theoretical model depicting the mechanisms of how emotion dysregulation is transmitted from parent to child through insensitive parenting practices, exacerbated by maternal mental health symptoms such as depression.

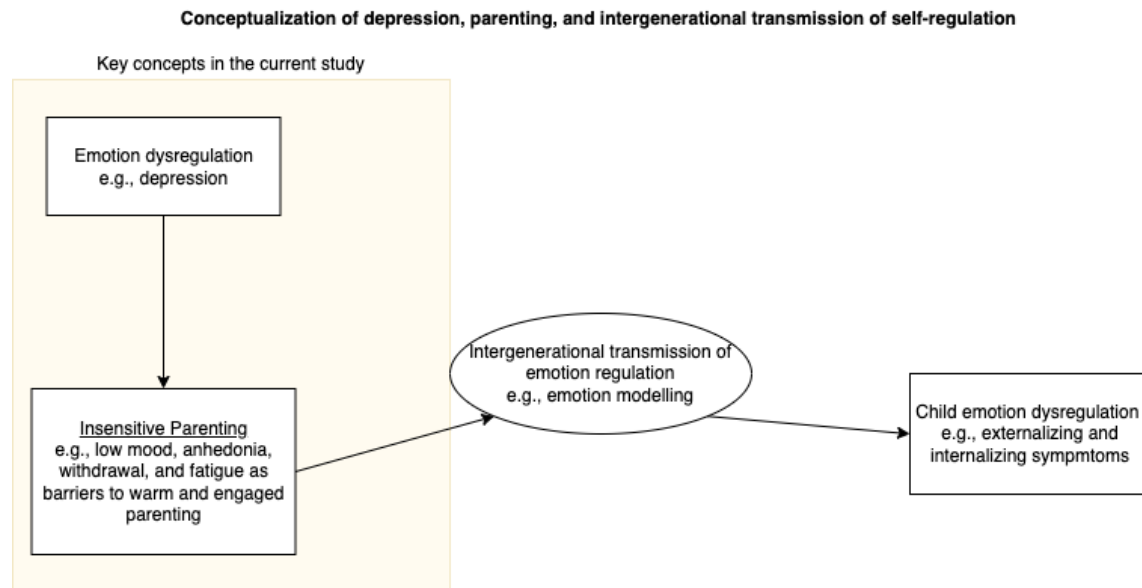


Figure 1. A theoretical conceptualization on the pathway between depression and parenting practices. The same proposed theoretical model applies to each of the mental health variables separately (depression, sleep disturbance, and anger), which jointly affect emotion dysregulation.

Depression & Sensitivity

Maternal depression is prevalent and is a leading cause of disease-related disability, with studies finding that 23% of Canadian mothers of toddlers aged 3-5, self-reported major depression or anxiety disorder symptoms (Ko et al., 2017; Statistics Canada, 2019). Recent evidence suggests elevated rates of maternal depression in parents of toddlers during the COVID-19 pandemic, compared to similar pre-pandemic cohorts (Davenport et al., 2020; Racine et al., 2021). Maternal involvement and healthy co-regulation in child emotion regulation are foundational for the development of emerging skills in child self-regulation (Cohodes, et al., 2020). The COVID-19 pandemic has increased reports of mental health service disruption (i.e., repeated lockdowns, staff cuts, reduced working hours), and exacerbated child and maternal mental health symptoms, especially for families with younger children and low-income families (Bhat 2021; Booth et al., 2018; Davenport et al., 2020; Emmen et al., 2013).

Furthermore, parenting sensitivity is an established pathway linking maternal depression to adverse child outcomes. In a meta-analysis of 48 studies and 4934 mother-infant dyads, mothers with higher levels of depression were less sensitive than mothers with fewer depression symptoms in observational assessments of dyadic interaction (Bernard et al., 2018). However, this meta-analysis examined parenting sensitivity during the infant years (0-12 months), which present different sets of challenges (e.g., managing return-to-work and adapting to new routines) than the toddler years, the focus of the current study. Toddlerhood is characterized by increases in both novel and more difficult child behaviour as increased child mobility contributes to parental stress (Fagot & Kavanagh, 1993; McQuillan et al., 2019). Behaviours such as hostility, negative parenting (e.g., negative affect, coercive behaviour), and disengaged parenting (e.g., ignoring, neutral affect) have demonstrated associations with maternal depression (Lovejoy et al., 2000; National Research Council [NRC], 2009). Withdrawn parenting practices can be partly explained through the reduced emotion regulation abilities and fatigue symptoms found in depression (Haga et al., 2012; Thomas & Spieker, 2016). Fatigue-related symptoms that increase impulsivity and elicit higher reactivity in depressed parents are related to behaviours like hostility and negative parenting (Lovejoy et al., 2000; Radke-Yarrow & Klimes-Dougan, 2002). Symptoms of depression often include social avoidance, wherein the absence of social support exacerbates depressive symptoms and increases insensitive parenting practices (Morris et al., 2017; Sperlich & Seng, 2018). Previous research has also found that mothers with more severe depression experience increased affect-related helplessness, which likely plays a role in depressed mothers' challenges to parent effectively and view themselves as active problem-solvers in parenting-related issues (Kelley & Donahue, 2003). Thus, we would expect the symptoms central to depression such as lower mood or anhedonia, to interfere with the ability to

parent sensitively. An example of this is parents' use of a "flat tone" when interacting with their children that is not due to hostility but an outcome of the prevalence of negative affect in depressive disorders (Psychogiou & Parry, 2017; Reuger et al., 2011).

Anger & Sensitivity

Previous research indicates that parenting behaviour is associated with self-report and observed emotions wherein parental negative emotions predict insensitive parenting behaviours (Rueger et al., 2011). Anger is an important predictor of insensitive parenting, with studies pointing to higher levels of negative maternal affect promoting over-arousal and influencing the ability to process and attend to situational cues (Duffy, 1957; Lemerise & Arsenio, 2000). This can look like erratic and unpredictable parenting behaviours more commonly endorsed by parents who experience anger or mental health issues (Parfitt & Ayers, 2012). Anger has also been found to affect one's ability to skillfully handle parenting stressors as heightened emotional states can induce rash and abrasive actions (Cyders & Smith, 2008). Considering common toddler behaviours such as tantrums and sleep challenges, over-arousal while faced with demanding cues (i.e., toddler crying as disruptive and warranting immediate attention) can provide an explanation for the presence of anger eliciting harsh and overreactive parenting (Matheny et al., 1995; Ateah & Durrant, 2005; Leung & Slep, 2006). Qualitative analyses indicate that the presence of current mental health challenges, specifically parental anger leads to experienced increased loss of control, difficulty controlling impulsive behaviour, and an interruption in parent-child bonding (Parfitt & Ayers, 2012). This study found that parental anger was associated with increasingly negative perceptions of the self, the baby, and parenthood in general, emphasizing the importance of interventions addressing experiences of anger for parents seeking mental health services (Parfitt & Ayers, 2012).

Sleep & Sensitivity

Sleep quality plays a crucial role in impulse control and emotion regulation (Ohayon, 2005; Sarsour et al., 2010; Zhang et al., 2012). Recent conceptual models of psychopathology have considered sleep disturbance as an etiologic or maintaining factor of mental illness due to its prevalence across diagnostic categories and its role in symptom severity (Harvey et al., 2011; Taylor et al., 2005). Sleep deprivation is a common experience among parents of toddlers, especially during the past two years of the COVID-19 pandemic and thus pose a challenge in the execution of sensitive behaviours encompassing executive functions (Wearick-Silva et al., 2021). During periods of disease containment procedures such as lockdowns, maternal sleep disturbance and a decrease in sleep quality were associated with a disruption in regular routines and greater household chaos (Kracht et al., 2021; Lucchini et al., 2022; Wang et al., 2021). Actigraphic measures of deficit sleep (defined here as short, variable, and late sleep) were associated with less observed positive parenting, even when researchers controlled for maternal cumulative risk in age, employment, and family size (McQuillan et al., 2019). Sleep deprivation heightens parental stress-management challenges, increasing negative emotionality, impulsivity, and sensitivity to lower-level stressors, which can limit parental ability to engage in emotionally sensitive behaviours (Minkel et al., 2012). Altogether, the literature points to depression, sleep, and anger as vital factors affecting parenting sensitivity and thus relevant to the disruption of sensitive parenting in later life.

Recent Stressful Experiences

Individual exposure to stress in the environment is important to the etiology and maintenance of psychological disorders such as depression (Nabeshima & Kim, 2013). There is a lack of consensus on one definition of a stressful experience but early theories on stressful events

characterized the individual as a system, whose available resources/responses are not equipped to address the demands of the event (Weiner 1992). Meta-analyses have emphasized the negative role of environmental stressors such as job insecurity, poverty, or family violence on psychological wellbeing, playing a significant role in the exacerbation of physical ailments, depression, and suicidal behaviour (Slavich 2020; Vrshek-Schallhorn et al., 2020). Stressful life events have been found to impact parenting behaviours. For example, the experience of poverty interferes with cognitive function, a requirement for the attention and executive planning operations central to sensitive parenting (Mani et al., 2013). Parents with a history of trauma and low-income parents have been observed to engage in harsh discipline and inconsistent parenting practices that are more likely to be rooted in stress and fear (Sastry 2014; Sharkey 2010).

Extant literature point to both personal psychological resources and contextual factors as critical in determining parenting sensitivity. It is also known that not every parent with depression engages in insensitive parenting, suggesting that sensitivity may be multiply determined. The accumulation of environmental risk factors has been shown to impact parenting such that mothers exhibit less responsiveness, which can look like less joint attention to build focus on the attention of the child (Wade et al., 2015). In a study examining 10 environmental risks, it was found that these risks were significantly more likely to co-occur together than on their own, pointing to a cumulative risk factor (Dong et al., 2004). At the postpartum stage, parenting sensitivity demonstrated between a mother and her infant has been observed to be negatively impacted by maternal exposure to stress (Kim 2021). Among mothers experiencing depression, lower income and social support moderated the association between their clinically relevant mood challenges and sensitive parenting of their 12-month-old infants (Goodman et al., 2017). Similar direction of moderation may be expected for mothers with depression and have

elevated unforeseen recent stressors like the loss of a job or their loved one. However, it is unclear how exposure to recent stress in the past 12 months affects parenting sensitivity during toddlerhood. Pandemic disasters and subsequent public health containment responses have been recorded to elicit clinically significant trauma responses in non-clinical cohorts of parents and their children (Sprang & Silman, 2013). Rates of maternal mental health concerns have demonstrated elevation in comparison to pre-COVID-19 pandemic cohorts (Cameron et al., 2020; Racine et al., 2021).

The Present Study

Prior literature suggests that the mental health symptoms of depression, sleep disturbance, and anger can affect sensitive parenting. Yet, there is a gap in understanding the relative importance of these mental health symptoms and their associations with sensitive parenting, and whether the strength of these associations is affected by recent stressful experiences. The extent to which these associations may have been relevant during the COVID-19 pandemic, in the presence of elevated mental health symptoms, is further unknown. The present study investigates these topics using a secondary analysis of baseline data from an intervention for mothers meeting clinical criteria for depression and/or anxiety: the Building Emotional Awareness and Mental Health (BEAM) program (Xie et al., 2022). The online assessment portion of this study offers unique insight into at-home observation, promoting accessibility. The BEAM program intended to examine the mental health (MH) needs and parenting challenges of a sample of parents of toddlers who are seeking support for internalizing symptoms that included both depression and/or anxiety. The current study did not exclude participants who only met criteria for an anxiety disorder for the purpose of examining the overall MH and parenting concerns of parents managing often co-occurring clinical presentations

(Falah-Hassani et al., 2017). This decision was made to preserve sample size and power while also ensuring a range of variability across symptom presentation of mental health, anger, and sleep.

Research Question 1. In a sample of mothers (toddlers aged 18-36 months old) with clinically significant symptoms of depression and/or anxiety, do current mental health symptoms (up to two weeks prior to the baseline assessment measures) of depression, sleep disturbances, and anger predict parenting sensitivity? It is hypothesized that severity of depression, sleep disturbances, and anger symptoms will predict lower parenting sensitivity.

Research Question 2. In the same sample of participants, will recent stressors moderate the association between depression and parenting sensitivity? Additionally, will recent stressors moderate the association between an overall score of mental health functioning and parenting sensitivity? It is hypothesized that for mothers who experienced greater levels of RSE, the link between depression and lower parenting sensitivity will be more pronounced in comparison to similar cohorts reporting less RSE. It is hypothesized that higher numbers of RSE endorsed strengthens the association between overall mental health functioning (MH composite) and parenting sensitivity.

Methods

Participants

Data was extracted from the BEAM toddler registered clinical trial (RCT) in 2022 (Xie et al., 2022). BEAM participants included 141 primary caregivers of toddlers ages 1.5-3 who identify as a woman (e.g., mother, grandmother, aunt) residing in Manitoba or Alberta. Of the 141 participants, 110 completed the pre-intervention online assessment of parenting sensitivity and constitute the sample of this study. Based on self-report online screening using the Patient

Health Questionnaire-9 (PHQ-9) and the General Anxiety Disorder 7-Item Scale (GAD-7) and clinical interviewing using the Mini International Neuropsychiatric Interviews (M.I.N.I.s), mothers met the recommended clinical threshold for moderate or severe depression or anxiety (≥ 10 ; Kroenke et al., 2001). The exclusion criterion included significant suicidal ideation, a history of attempted suicide in the past year, or self-harm in the past six months. Recruitment occurred through online advertisements using paid social media posts such as Facebook and Instagram, as well as postings by community partner agencies through email lists or public announcements (MacKinnon et al., 2022).

Participants varied in age from 22 to 44 years ($M = 32.5$ years, $SD = 4.99$ years) and 66.4% self-identified as white. Ethnic ancestry breakdown is as follows: Indigenous (21.4%), White European (15.7%), Latin American (3.6%), Southeast Asian (2.9%), Black Caribbean (1.4%), Black African (1.4%), Indo-Caribbean (.7%), South Asian (.7%), Middle Eastern (.7%), and Other (2.1%). Most participants (71.4%) had one or two children, with 18.6% having three children and 9.9% having four or more children. Employment status revealed that 33.6% of the sample were engaged with full-time employment, 17.9% with part-time employment, 16.4% on leave, and 31.4% of the sample were experiencing unemployment at the time of data collection. The annual household income was averaged between \$70,000-80,000 (CAD) for this sample. This is roughly on par with the annual household income average in the province of Manitoba, which stood at \$80,000 CAD in 2021. The annual household income breakdown is as follows: < \$30,000 (29.6%), \$40,000-60,000 (8.1%), \$60,000-80,000 (13.4%), \$80,000-100,000 (15.6%), and \$100,000+ (33.3%).

Measures

Mental Health Measures

Patient Health Questionnaire (PHQ-9). The PHQ-9 is a self-report, nine-item questionnaire that was used to measure maternal depression presence and severity (Kroenke et al., 2001). Previous research has supported its excellent validity in multiple samples of clinical and non-clinical cohorts (Williams, 2014). A sample item from the PHQ-9 is: “Over the past 2 weeks, have you been bothered by... feeling down, depressed, or hopeless”, rated on a 4-point scale from “0 = Not at all” to “3 = Nearly every day” (Kroenke et al., 2001). Sum scores range from 0 to 27, with higher numbers indicative of more severe depression symptoms. The PHQ-9 is most effective at detecting clinical depression in a perinatal population at a cut-off score of 10 (Sidebottom et al., 2012). The current sample was characterized by higher self-reported ratings of depression on the PHQ-9 ($M = 14.31$, $SD = 5.43$). The average self-reported depression symptoms were above the recommended clinical cut-off ($PHQ-9 \geq 10$). 79% of our sample scored at or above the recommended clinical cut-off on the PHQ-9, with scores ranging between 3 to 26. The PHQ-9 was found to be highly reliable (9 items; $\alpha = .806$).

The Patient-Reported Outcomes Information System (PROMIS-SD) Sleep Disturbance Scale. This measurement was developed to determine self-reported perceptions of sleep quality, sleep depth, and any difficulties falling and staying asleep over a seven-day period (Cella et al., 2010; Buysse et al., 2010). The current study uses a shortened, 8-item instrument (Yu et al., 2012). The PROMIS Sleep Disturbance Scale has been validated in postpartum and young adult samples and has since been adapted for use in both clinical and research settings (Full et al., 2018; Thomas & Spieker, 2016). Possible sum scores range from 8 to 40, with higher scores suggesting greater sleep disturbance. A sample item from this scale is: “I had difficulty falling asleep”, rated on a scale of “1 = Not at all” to “5 = Very much” (Yu et al., 2012). Sleep disturbance on the PROMIS-SD remained at mild levels for this sample ($M_{t\text{-score}} = 58.30$, M_{raw}

score = 28.21, $SD_{\text{raw score}} = 6.59$). The PROMIS instruments standardize the general population t-scores at 50 with a standard deviation of 10 (Rose et al., 2014). Typically, one standard deviation above the mean can warrant clinical attention. The PROMIS-SD demonstrated excellent reliability (8 items; $\alpha = .886$).

The Patient-Reported Outcomes Information System (PROMIS-A) Anger Scale.

This measurement was developed to determine self-reported perceptions of recent experiences of angry moods such as irritability and reactivity, negative cognition (e.g., envy, interpersonal sensitivity, vengefulness), verbal aggression, and efforts exerted to control anger (Cella et al., 2010). A sample item is as follows: “I felt like I was ready to explode.” Participants were asked to recall their experiences with anger over the past seven days, rating each item on a 5-point Likert scale of “1- never” to “5- always.” Possible scores range from 5 to 25, with higher numbers indicative of more severe anger. The PROMIS Anger Scale has demonstrated excellent validity and reliability across multiple samples (Cella et al., 2010). This sample demonstrated a moderate levels of anger problems, as measured through the PROMIS-A ($M_{\text{t-score}} = 63$, $M_{\text{raw score}} = 17.69$, $SD_{\text{raw score}} = 3.08$). This scale demonstrated excellent reliability (5 items; $\alpha = .840$).

The Recent Stressful Experiences (RSE) Scale. This measurement was developed by Harvard’s Center on the Developing Child based on recommendations from the JPB research network on toxic stress (Centre on the Developing Child, 2021). This measure of recent stressful experiences (RSE) used in the current study attempts to capture similar constructs to the measure of lower income and social support used in the Goodman et al. (2017) study. Participants are asked to self-report the number of stressful events experienced within the past 12 months on a list of 10 possible events. Stressful events range from an illness or death of someone close to the participant, separation/divorce, recent moves of residency, job loss, or any event that the

participant self-identifies as bad/negative. Results on the RSE represent a non-continuous variable with possible scores ranging from zero to all ten stressful events endorsed. (See Appendix A). The current sample experienced a mild number of RSE ($M = 2.61$, $SD = 1.87$).

Mental Health (MH) Composite. This measure was created by aggregating the variables of depression (PHQ-9), sleep disturbance (PROMIS-SD), and anger (PROMIS-A) through a total summed variable. The purpose of the MH Composite score is to examine whether a measure of overall mental health functioning or individual variables differently predicts potential variance in the dependent variable of parenting sensitivity.

Parenting Sensitivity Measure

Maternal Behaviour Q-Sort (MBQS Q-Sort). An observational coding assessment based on Q-methodology was developed by Pederson et al. (1990) to assess parenting sensitivity in dyadic interactions. A shorter, 25-item version is best practice for brief study observations of mother-child dyads (Tarabulsky et al., 2009). This can be used to code interactions for both in-person and videotaped observations. Key behavioural themes coded by the MBQS entail an accurate reading of and response to the child's signals; synchronous interactions that reflect the child's tempo and mood; scaffolding of child attention and exploration, attending to the child in the face of competing demands; realistic expectations about child's emotion regulation abilities; and the ability to accept child's behaviour when it contradicts maternal expectations (Pederson et al., 1990). To date, the MBQS Q-sort measure for mothers with toddlers has been used for in-person home visits. The current study uses the same measure to assess videotaped, online interactions. The online lab assessment is one hour long and began with a calming video to elicit baseline dyadic functioning. The child was led through a standardized Stroop task (a measure of

cognitive inhibitory responses), a frustrating cognitive task, a free play time between mother and child, and a delayed gratification task for the child.

Observed parenting measures were collected via Zoom online video calls and uploaded as videos to a password-protected lab hard drive. To extant knowledge, the current study is among a handful of studies evaluating parenting sensitivity completely online through the MBQS Q-sort, a best-practice method of assessing sensitivity (Behrens et al., 2014). All videos were unidentified and renamed according to participant number. Research assistants were thoroughly trained on the observation procedure during a comprehensive observation manual and training sessions with clinical psychology graduate students. Coding was completed in a group of 18, led by a previous coder who is a psychology graduate student. Coding teams consisted of senior undergraduate students in psychology. Each coder force sorted 25 cards depicting different maternal behaviours into five equal piles ranging from 1 “very unlike” to 5 “very like” the mother (Pederson et al., 1996). Each item is scored from -2 to +2 and each “sort pile” is correlated with The sort generates a composite score ranging from -1 to +1, which represents the likeness between a prototypically “sensitive” mother and the observed mother (Tarabulsky et al., 2009). Under this scoring system, higher positive values demonstrate greater parental sensitivity while lower values below zero indicate lower parental sensitivity.

Interrater Reliability. Coding of videos and subsequent discussions occurred in two smaller groups with the guidance of the graduate student each week. Reliability within each group was computed using intra-class correlation coefficients (ICCs), a widely used tool of reliability in interrater analyses. A 95% confidence interval for an ICC estimate identifies values less than 0.5 as poor, values between 0.5-0.75 as moderate, between 0.75-0.9 as good, and values higher than 0.9 as excellent reliability (Koo & Li, 2016). Coders who reached a reliability

coefficient of 0.7 started to code assigned videos on their own. Meetings with graduate students to discuss disagreements continued until reliability was reached with each team member. The correlations between the two observers' parenting sensitivity scores were between .70 and .97.

Exponential Transformation. Sensitive parenting had a skewness of -2.41, which is in line with extant literature finding a negative skew, with means concentrated above zero (Lindhiem et al., 2011; Tarabulsky et al., 2003; Tarabulsky et al., 2009). In the current study, the variable of parenting sensitivity was treated with an exponential transformation to improve the intelligibility of visual data representations and measures of central tendency. Prior to exponential transformation, the variable of parenting sensitivity had a skewness of -2.41, a mean of .72 and a standard deviation of .48, with all scores ranging between -.96 and 1. After an exponential transformation, this variable had a skewness of -1.85, a mean of 2.29 and a standard deviation of .57, with a sample range between .38 and 2.72.

Sample Means. Parenting sensitivity scores in this sample ranged between -.96 to 1.00 ($M = .72$, $SD = .48$). However, parenting sensitivity scores are not standardized in the literature, which renders qualitative interpretation difficult. The means and standard deviations of the mental health variables, the recent stressful experiences variable, and the parenting sensitivity variable are displayed in *Table 1*.

Measure	Mean	Standard deviation	Range
Depression severity (PHQ-9)	14.31	5.43	3.0-26.0
Sleep disturbance (PROMIS-SD)	58.30	6.59	41.1-76.5
Anger (PROMIS-A)	63	3.08	50.5-83.3
Recent Stressful Experiences (RSE)	2.61	1.87	0-8

Parenting sensitivity (MBQS)	<i>Raw score</i>		
	.72	.48	-.96-1.00
	<i>Transformed</i>		
	2.12	.57	.38-2.72

Table 1. The means, standard deviations, and ranges of the mental health and parenting variables of interest in this study.

Procedure

Upon selection and enrollment in the current study, participants received an informed consent form, detailing the purpose and requirements of the study. After obtaining electronic informed consent, mothers completed the baseline package survey, which includes the measures described in the *Methods* section, along with others not explored in the current study. The mother-child dyad completed the Zoom assessment task, and this videotaped interaction was rated by groups of psychology students. This study only analyzed baseline measures of mental health, recent stressful events, and parenting sensitivity taken pre-intervention. See the full study protocol and trial registration on ClinicalTrials.gov (Identifier: NCT04772677). Ethics approval was obtained from the Psychology/Sociology Research Ethics Board (P2020:081) at the University of Manitoba and the Conjoint Health Research Ethics Board (REB20-1933) at the University of Calgary.

Data Analysis

All analyses were conducted in SPSS Version 24 (IBM Corp, 2016). To test the main effects of maternal mental health outcomes (depression, sleep, and anger) and their associations with parenting sensitivity, a series of linear regressions were conducted. Based on the recommendations of Frazier et al. (2004), a two-step process was followed. The first step

attempts to determine the main effects by regressing the outcome (parenting sensitivity) on the predictor (mental health outcomes). These analyses were conducted separately for all three mental health variables. All variables were generated from baseline assessments data on the participants and listwise deletion was used to manage missing data. There was a total of 31 missing data points for the pre-intervention parenting sensitivity assessment ($N = 110$). A mental health (MH) composite score was computed using aggregate data from the depression, sleep, and anger variables. This score intends to gauge whether the three individual variables or the overall indicator of mental health (the composite score) are more predictive of parental sensitivity. The second step attempts to test the moderating effect of RSE in the association between any independent variables (IVs) that were significant on their own as individual coefficients to use in the moderation and parenting sensitivity. After initial regression analyses, the only independently significant IV was determined to be depression (see *Figure 2*).

Power. Based on previous literature, we expect a medium effect size for Research Question 1 and a small effect size for Research Question 2 (Lovejoy et al., 2000; Morris et al., 2021). Power analyses were conducted in G*Power 3.1 for a two-tailed analysis with a power of 95%, alpha of 0.05, and an effect size of 0.3, showing that a sample size of at least 46 is needed (Faul et al., 2009). This shows that the current study's sample size of 110 is sufficient for the objectives of this proposal.

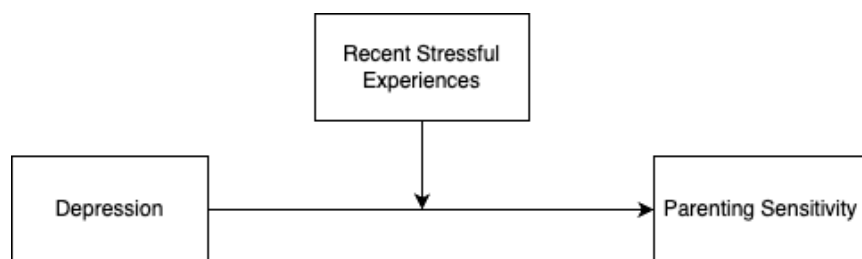


Figure 2. The theoretical model demonstrates the moderating effect of RSE on the association between current mental health outcomes (i.e., depression) and parenting sensitivity.

Results

This study sought to investigate associations between the mental health symptoms of depression, sleep disturbance, and anger on sensitive parenting. The following hypotheses were proposed in **Research Question 1**: H₁₋₃: there would be a significant negative association between depression (H₁), sleep disturbance (H₂), and anger (H₃), with parenting sensitivity. H₄: there would be significant negative association between overall mental health and parenting sensitivity. **Research Question 2**: RSE would have a moderating effect on the association between depression and parenting sensitivity (H₅) and the association between mental health functioning and parenting sensitivity (H₆).

Preliminary Correlations

A bivariate correlational analysis revealed a significant, negative correlation between parenting sensitivity and the variables of depression, sleep disturbance and RSE (see *Table 2*). The mental health symptom of depression demonstrated a negative but weak correlation with the number of children in the household and with RSE. Depression scores showed a moderate and positive correlation with sleep disturbance and anger. Sleep disturbance demonstrated a moderately positive correlation with anger. RSE showed a weak but positive correlation with the number of children in the household.

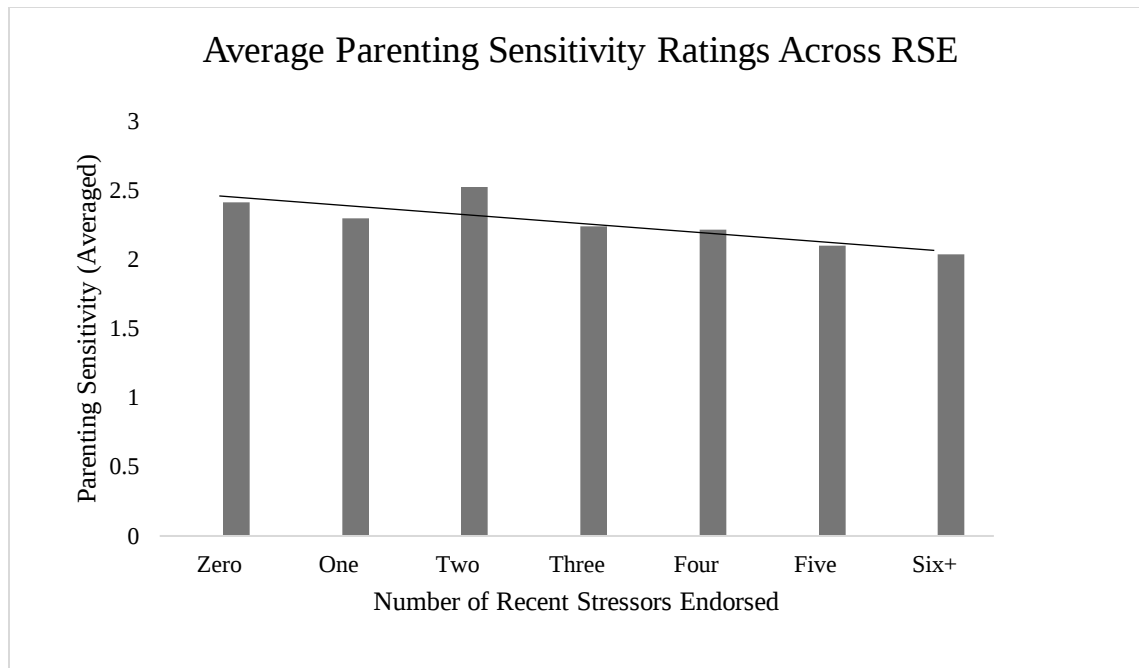


Figure 3. Average observed parenting sensitivity scores across number of RSE endorsed (error bars show standard errors). ($N = 101$).

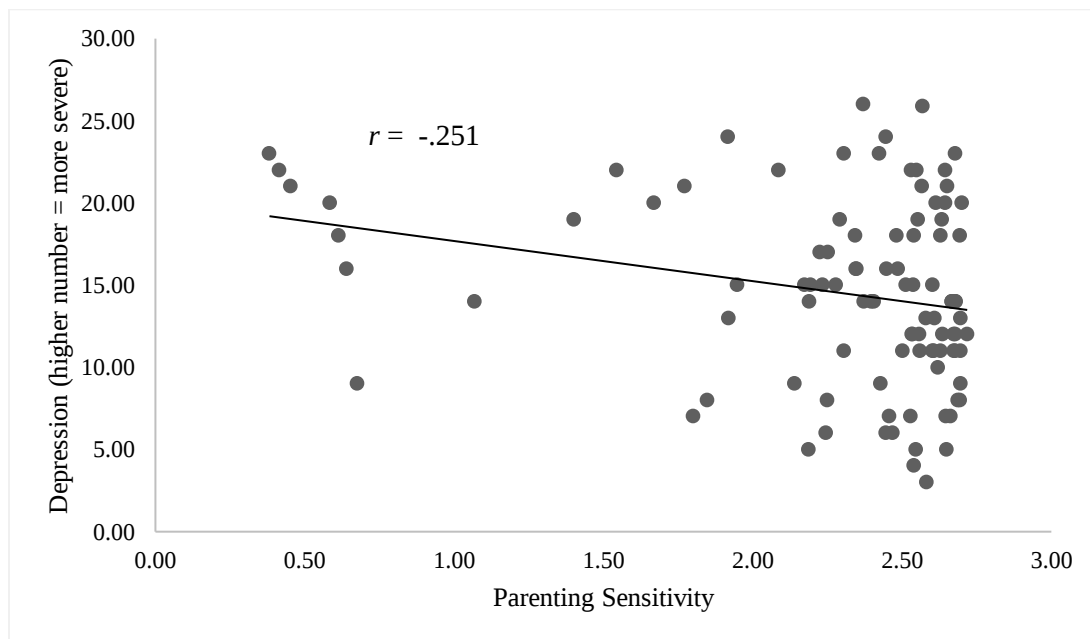


Figure 4. A scatterplot depicting the association between depression symptom severity and the exponentially transformed variable of observed parenting sensitivity ($N = 100$).

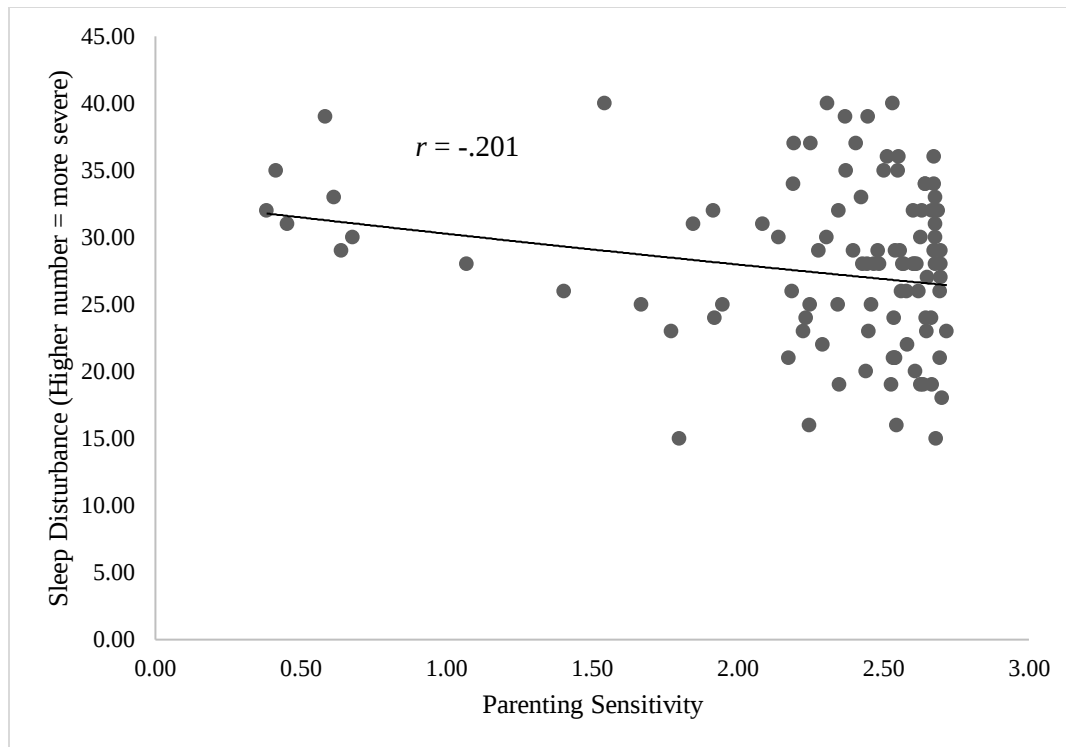


Figure 5. A scatterplot depicting the association between sleep disturbance severity and the exponentially transformed variable of observed parenting sensitivity ($N = 101$).

Regressions

To examine the hypothesis that there is a significant, negative linear association between parenting sensitivity and maternal mental health variables, the dependent variable (parenting sensitivity) was regressed on predicting variables of depression, sleep disturbance, and anger. The overall model was significant, $F(3, 96) = 3.014$, $p < 0.05$, and the $R^2 = .086$ indicates that the model explains 8.6% of the variance in parenting sensitivity. Additionally, coefficients were assessed to examine the influence of each independent variable on the dependent variable (parenting sensitivity). H_{1-3} hypothesized that maternal depression, sleep disturbance, and anger would have significant, negative associations with parenting sensitivity. Regression results indicate that maternal depression has a significant negative association with parenting sensitivity ($B = -.020$, $t = -2.186$, $p < 0.05$). Sleep disturbance ($B = -.010$, $t = -1.267$, $p = .248$) and anger (B

= .021, $t = 1.255$, $p = .228$) were not found to have a significant association with parenting sensitivity in the full regression. The results are presented in *Table 3*.

To examine the hypothesis that there is a significant, negative linear association between parenting sensitivity and the maternal mental health (MH) composite score, parenting sensitivity was regressed on the predicting variable of the MH composite. The overall model was significant, $F(2, 98) = 5.235$, $p < .05$, and the $R^2 = .05$ suggests that the model explains 5% of the variance in parenting sensitivity. Additionally, coefficients were further assessed to examine the influence of each independent variable on the dependent variable. The results suggest that the mental health composite variable ($B = -.870$, $t = -2.288$, $p < .05$) had a significant negative association with parenting sensitivity.

To examine the hypothesis that overall mental health functioning and recent stressful experiences have a significant negative association with parenting sensitivity, a third linear regression analysis examined the predictor variables of the MH composite and RSE and its association with the dependent variable. The overall model was significant, $F(2, 98) = 4.083$, $p < 0.05$, and the $R^2 = .077$ suggests that the model explains 7.7% of the variance in parenting sensitivity. The results of the coefficient analysis suggest that the mental health composite variable ($B = -.737$, $t = -1.915$, $p = .058$) and recent stress experiences ($B = -.052$, $t = -1.684$, $p = .095$) have non-significant marginal negative associations with parenting sensitivity when included in the same regression.

Moderation

This study next assessed the moderating role of RSE on the association between depression (a significant mental health symptom from regression 1) and parenting sensitivity. In this analysis, the dependent variable of parenting sensitivity was regressed on predicting

variables of depression, RSE and an interaction variable between RSE and depression. The overall model significantly predicted parenting sensitivity significantly explained variance in parenting sensitivity, $F(5, 94) = 3.198, p < 0.05$. The $R^2 = .909$ suggests that the model explains 9.09% of the variance in parenting sensitivity. Additionally, coefficients were further assessed to examine the influence of each independent variable on the dependent variable (parenting sensitivity). The interaction variable of RSE x depression ($B = -.005, t = -.828, p = .115$) was not found to have a significant impact on the change in variance in parenting sensitivity. After adding the interaction term, the effect of depression ($B = -.016, t = -.841, p = .403$) and RSE ($B = .086, t = .070, p = .945$) on sensitivity was smaller and no longer significant. Results are represented in *Figure 6*.

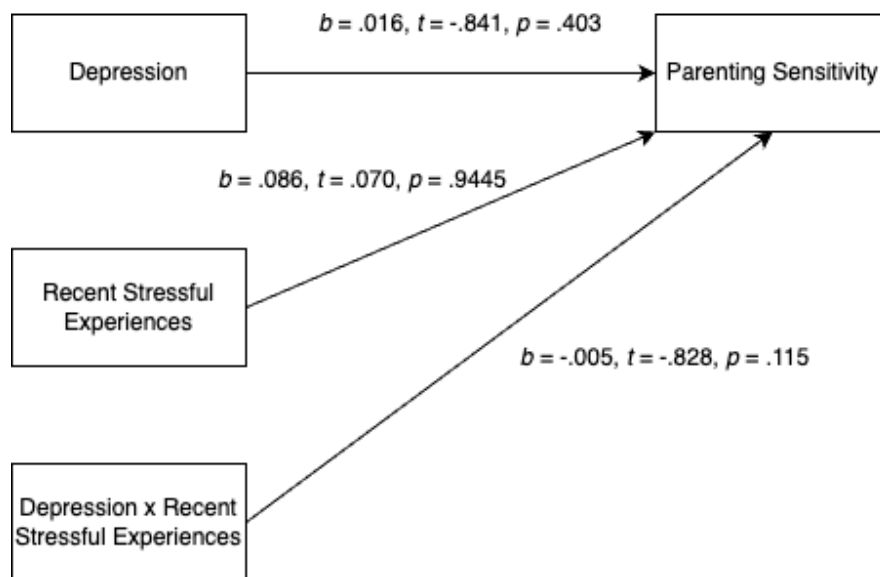


Figure 6. A statistical diagram depicting the non-significant moderating effect of RSE on the association between depression and parenting sensitivity.

Discussion

General Findings

The current study examined links between an online observation of parenting sensitivity and mental health symptoms in a treatment-seeking sample of mothers who met criteria for depression and/or anxiety. Extant literature on maternal depression suggests that mental health symptoms like depression, sleep disturbance, and anger can affect sensitive parenting beyond the postpartum years (Guyon-Harris et al., 2015; Leckman-Westin et al., 2009). When parents experience stressful life events, the impacts of poor mental health on parenting may be more pronounced. This is important to understanding environmental risk that render some mothers more vulnerable to the development and persistence of mental health challenges. It was hypothesized that mental health challenges, including depression, sleep disturbance, and anger, would predict lower parenting sensitivity and that RSE would exacerbate (i.e., statistically moderate) the impacts of mental health challenges on parenting sensitivity. Broadly, results were in support of links between depression, sleep, and RSE with parenting sensitivity, with limited support in this sample for links between anger and sensitivity. RSE were not found to be a significant moderator in the association between depression and parenting sensitivity in this sample.

More specifically, depression was a significant predictor of parenting sensitivity at the bivariate correlation level and in a multivariate regression such that higher depression was associated with lower sensitivity. These findings are consistent with the body of literature on the link between depression and parenting sensitivity. At the toddler stage, instances of mismatch in the parent-child dyad are frequent yet central to the parenting process (Feldman, 2007). Opportunities for reinforcing attachment and enhancing child emotional development are found in the response to ruptures in these interactions, requiring both synchronicity and contingency of the parent (Feldman, 2007; Hoffman et al., 2009). For example, mothers experiencing depression

were less likely to repair conflictual interactions likely due to emotion regulation and attention difficulties that create challenges to synchronous behaviour (Haga et al., 2012; Hoffman et al., 2009; Lovejoy et al., 2002). At the toddler stages, maternal depression may impede with the quality of interaction through an increase in parenting practices such as harsh disciplinary methods, less emotional scaffolding, and less maternal warmth (Choe et al., 2013; Gelfand & Teti, 1990).

Although sleep was significantly associated with parenting sensitivity at the bivariate correlation level, it was no longer a significant predictor of parenting sensitivity in the multivariate analysis with other mental health variables. A possible theoretical explanation for the shared variance between depression and sleep issues is that sleep disturbance in either insomnia or hypersomnia presentations is one of nine symptoms of major depressive disorder (MDD), which can explain the elevated endorsement of both depression and sleep disturbance in this sample (American Psychiatric Association, 2022). Previously, women have been found to experience elevated sleep problems during the COVID-19 pandemic in comparison to men, thus, it is possible that the participants in this study (all women-identified) experienced elevated sleep and mood disturbance in response to a global pandemic and subsequent lockdown procedures (Beck et al., 2020; Robillard et al., 2020). In addition, anger was not found to be a significant predictor of parental sensitivity. There is the likelihood that parental anger is more relevant in high-conflict interactions in the parent-child dyad. However, the parenting sensitivity assessment did not include high-conflict situations, which provide challenges in linking parental anger with sensitivity as measured through the MBQS parenting sensitivity measure. Additionally, the participants in this sample were screened to meet criterion for a diagnosis of depression and/or anxiety but not for clinically relevant levels of sleep disturbance or anger. A possible implication

of this decision is that depression contributes a greater percentage of variance to the dependent variable individually than other mental health variables.

The analysis included a test of the moderating effects of RSE on the link between mental health symptoms (depression only) and parenting sensitivity (**Research Question 2**). When the RSE variable was added to the model, results suggested that mothers experiencing more RSE also scored lower on the assessment of parenting sensitivity. These results reflect extant literature indicating that maternal cumulative risk is strongly related to parenting behaviours such as sensitivity. Greater cumulative stress has been linked with greater rigidity in parenting styles (Liu & Merritt, 2018). Stressful early and recent life events such as job insecurity or illness in the family are linked to greater vulnerability to psychopathology, with the onset of a depressive episode occurring immediately after and years later (Assari & Lankarani, 2016; Boyce & Ellis, 2005). Wade et al. (2015) used the MBQS to assess parenting sensitivity and demonstrated that cumulative social risk (i.e., family status risk, home safety, maternal depression and education, and history of physical/sexual abuse during childhood) predicted longitudinal changes in parenting behaviour. Mindful parenting has been found to be challenging for parents experiencing depression, a MH concern that complicates careful observation of, and contingency to child behaviour (Fernandes et al., 2020). However, the timing of the current study being administered during the COVID-19 pandemic may pose unforeseen challenges to the proportion of variance in the RSE questionnaire, whose items are intended to measure general unpredictability of life events such as family violence, divorce, job loss, or academic stressors. The environmental stressor of COVID-19 related lockdown procedures provided a unique condition for the participants of the current study. Likely, origins of recent stressful experiences were related to the pandemic, which was a common experience for mothers during this time. It is

possible that this cohort of mothers experiencing recent stress due to the pandemic and subsequent lockdown procedures had access to resources to counter any potential negative effects. Environmental stressors appear to be relevant to maternal stress and have demonstrated small-moderate effect sizes on parenting sensitivity (Booth et al., 2018). The available cognitive resources for childrearing in the context of recent stressors is diminished due to a decrease in maternal attention and nurturance (Dix et al., 2004). This may suggest that RSE explained additional variance in parenting sensitivity above and beyond the impacts of depression.

A unique contribution of this study is the online assessment of parenting sensitivity using the MBQS Q-sort rating system. Parenting sensitivity is best measured through in-person observational methods, and yet online observation using the MBQS remain scarce. Since the COVID-19 pandemic-induced lockdowns, there has been an increased need for the use of online research methods to assess parenting sensitivity. The recent publication of a protocol using online assessment of MBQS highlights that the recent spike in adapting assessments to online procedures demonstrates that there is ongoing interest in web-based measures to lower barriers to access (Khoury et al., 2023). Given the established pattern of increased anxiety in parents and their children during periods of global pandemic and subsequent disease-containment measures, it can be especially important to further develop online mental health delivery to mitigate the negative mental health effects of such pandemics (Sprang & Silman, 2013). Further development of online mental health services in both intervention and assessment also provides an important and accessible opportunity for parents in rural and remote regions to access services and to contribute to research. This current study demonstrated the feasibility of a completely remote implementation of the MBQS, which is typically assessed in-person.

Limitations

A limitation of the current study is the reduced variability in parenting sensitivity scores, as a mean of .72 can generally be regarded as “sensitive” parenting (Pederson et al., 1998). The ceiling effect occurs when a large portion of a sample score close to the upper limit of a variable, impairing the ability to gauge measures of central tendency and measures of dispersion. The ceiling effect can lead to faulty comparisons and inappropriate model selection when ignored (Wang et al., 2008). The current study completed an exponential transformation of the parenting sensitivity variable to address this issue. Nonetheless, the parenting sensitivity variable demonstrated moderate positive skew, meaning that most of the mothers demonstrated sensitivity when interacting with their child. This reflects the results of prior studies using the MBQS to measure parenting sensitivity, with means generally being well above zero (Lindhiem et al., 2011; Tarabulsky et al., 2003; Tarabulsky et al., 2009). In the absence of a normally distributed sample, our results captured a homogenous parenting sensitivity presentation. However, this may reflect the sample of treatment-seeking mothers who are likely concerned about the effects of disease-containment lockdown procedures on toddler development, which were widespread (Yaffe 2023). The participants in the current study met the provincial average household income rates (~\$80,000 – 90,000 CAD), were screened out for active suicidal ideation, and sought out treatment. These characteristics indicate that our sample did not come from high-risk groups (i.e., low income, single motherhood, severe psychiatric illness) with lower RSE endorsed, whose presence is linked to lower sensitivity (Booth et al, 2018; Finegood et al., 2016). The initial intent of the study was to examine mental health symptoms for mothers with lower scores in parenting sensitivity. The current sample demonstrated an upper ceiling effect thereby limiting power to examine findings at the lower end of the sensitivity measure.

While the observation of parenting sensitivity is a strength in this study, all other mental health measures are self-reported and cross-sectional data. Inclusion criteria to participate in the study required those identifying as mothers to endorse clinical concerning mental health presentations. Therefore, it is unclear if the results of this study may generalize to other samples such as a non-clinical population or to parents who do not identify as women.

Future Directions

Further observation of maternal anger and sensitivity may be worthwhile in future studies on maternal mental health with higher levels of externalizing emotion dysregulation, as prior work has observed links between harsher disciplining practices and parental anger, creating a feedback loop producing lower self-regulation in the child and subsequent harsher discipline (Barn & Malmberg, 2017; Lorber et al., 2011; Smith-Slep & O’Leary, 2007; Rhoades et al., 2017). Thus, parental anger can interfere with sensitive parenting through interference with impulse control and emotion regulation pathways. The results of the current study must be viewed through the specific context of the COVID-19 pandemic and associated mental health and parenting challenges. Similar work examining parenting sensitivity and mental health in the context of recent stressors is a worthwhile research pursuit in the recovery from the COVID-19 pandemic. Additional critical perspectives needed include replicating the current methods of parenting sensitivity and depression for individuals identifying as fathers. Historically, the bulk of parenting research on sensitivity has focused on the mother-child dyad, leaving a gap in the literature on paternal sensitivity and its links to mental health concerns like depression, sleep, and anger.

Implications

The results of this study demonstrate a significant association between maternal depression and parenting sensitivity, highlighting the importance of parenting interventions to target maternal mental health and mood in the context of recent life stressors, even past the postpartum stage. These results contribute to the well-established literature highlighting the importance of maternal mental health to healthy parenting practices (Kersten-Alvarez et al., 2011). A few interventions that join both parenting and mood targets have demonstrated positive results on both parenting and mental health (Kersten-Alvarez et al., 2011; Perrone et al., 2021; Potharst et al., 2017). Similarly, clinical implications indicate the relevance of administering brief assessment of parental mental health when targeting parenting behaviours. Meta-analyses on mindfulness-based parenting randomized control trials (RCTs) examining the efficacy of mindful parenting interventions on parenting and mood have demonstrated improvements in positive parenting (Shorey & Ng, 2021). Online delivery of parenting intervention for improving parental emotion regulation and psychological flexibility has shown promising results.

Tables

Table 1

The means, standard deviations, and ranges of the mental health and parenting variables of interest in this study.

Measure	Mean	Standard deviation	Range
Depression severity (PHQ-9)	14.31	5.43	3.0-26.0
Sleep disturbance (PROMIS-SD)	58.30	6.59	41.1-76.5
Anger (PROMIS-A)	63	3.08	50.5-83.3
Recent Stressful Experiences (RSE)	2.61	1.87	0-8
Parenting sensitivity (MBQS)	.72	.48	-.96-1.00

Table 2

Correlations between parenting sensitivity, maternal demographic characteristics, and the mental health variables of depression, sleep disturbance, anger, and recent stressful experiences

		1	2	3	4	5	6	7	8
1. Parenting sensitivity	Pearson Correlation	1	-.026	-.089	.104	-.251*	-.201*	-.056	-.206*
	Sig. (2-tailed)		.798	.386	.299	.012	.043	.581	.039
	N	110	101	97	101	100	101	101	101
2. # of Children	Pearson Correlation	-.026	1	.138	-.145	.200*	-.019	.144	.230**
	Sig. (2-tailed)	.798		.110	.087	.018	.819	.089	.006
	N	101	140	135	140	139	140	140	140
3. Target child age	Pearson Correlation	-.089	.138	1	-.096	.129	-.007	.036	.083
	Sig. (2-tailed)	.386	.110		.270	.137	.938	.679	.341
	N	97	135	135	135	135	135	135	135
4. Target child sex	Pearson Correlation	.104	-.145	-.096	1	-.147	.065	.008	-.243**
	Sig. (2-tailed)	.299	.087	.270		.084	.442	.929	.004
	N	101	140	135	140	139	140	140	140
5. Depression	Pearson Correlation	-.251*	.200*	.129	-.147	1	.527**	.513**	.221**
	Sig. (2-tailed)	.012	.018	.137	.084		<.001	<.001	.009
	N	100	139	135	139	139	139	139	139
6. Sleep disturbance	Pearson Correlation	-.201*	-.019	-.007	.065	.527**	1	.359**	.165
	Sig. (2-tailed)	.043	.819	.938	.442	<.001		<.001	.052
	N	101	140	135	140	139	140	140	140
7. Anger	Pearson Correlation	-.056	.144	.036	.008	.513**	.359**	1	-.020
	Sig. (2-tailed)	.581	.089	.679	.929	<.001	<.001		.816
	N	101	140	135	140	139	140	140	140
	Pearson Correlation	-.206*	.230**	.083	-.243**	.221**	.165	-.020	1

8.Recent stressful experiences	Sig. (2- tailed)	.039	.006	.341	.004	.009	.052	.816	
	N	101	140	135	140	139	140	140	140

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3

Regression between the independent predictors of depression, sleep, and anger on parenting sensitivity

Predictor	<i>b</i>	<i>b</i> 95% CI [LL, UL]	<i>beta</i>	<i>t</i>	<i>p</i>
1 (Constant)	2.608	.383		6.808	<.001
Depression	-.024	.013	-.236	-1.881	.063
Sleep	-.010	.011	-.107	-.963	.338
Anger	.024	.023	.125	1.055	.294
RSE total stressful experiences	-.043	.032	-.136	-1.339	.184

a. Dependent Variable: parenting sensitivity

Figures

Figure 1

A theoretical conceptualization on the pathway between depression and parenting practices.

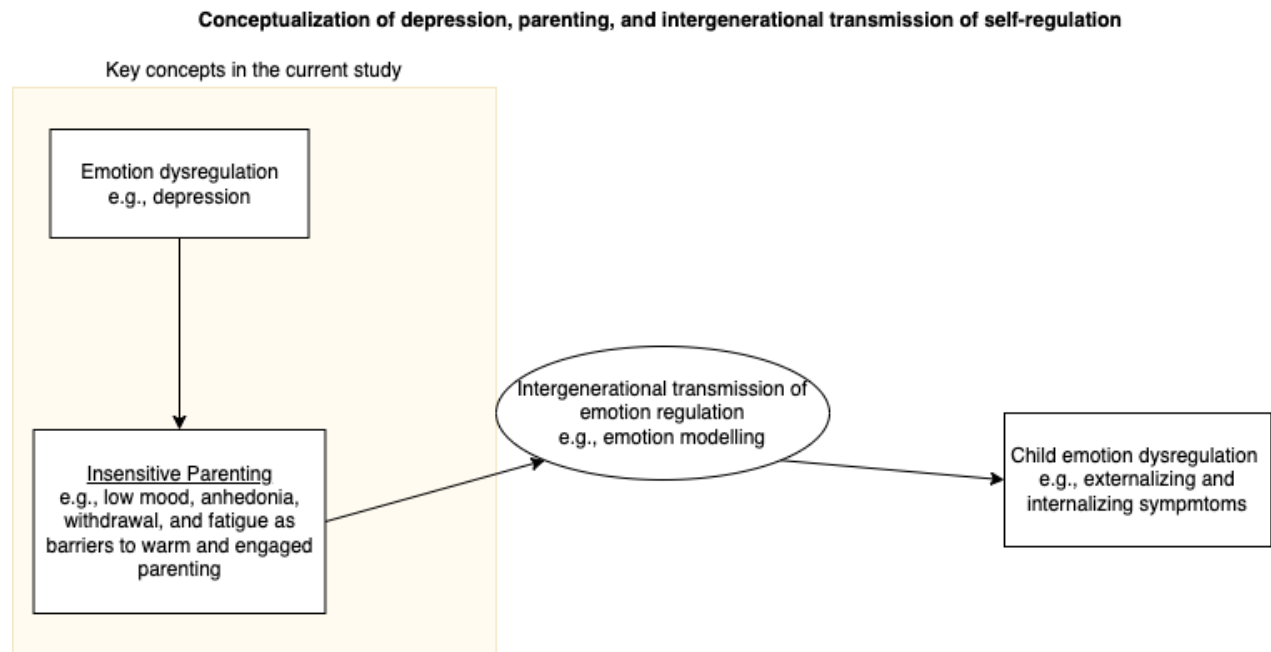


Figure 2

This theoretical model demonstrates the moderating effect of RSE on the association between current mental health outcomes (i.e., depression) and parenting sensitivity.

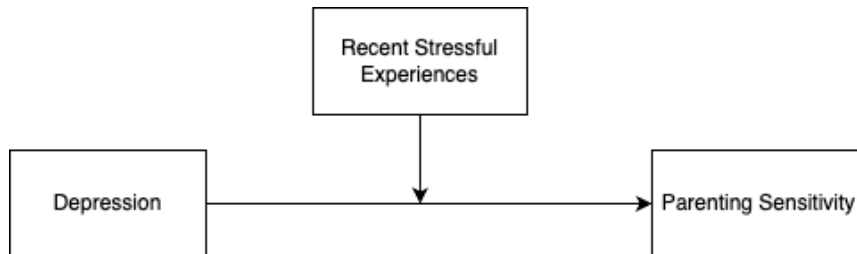


Figure 3

Average observed parenting sensitivity scores across number of RSE endorsed (error bars show standard errors). (N = 101).

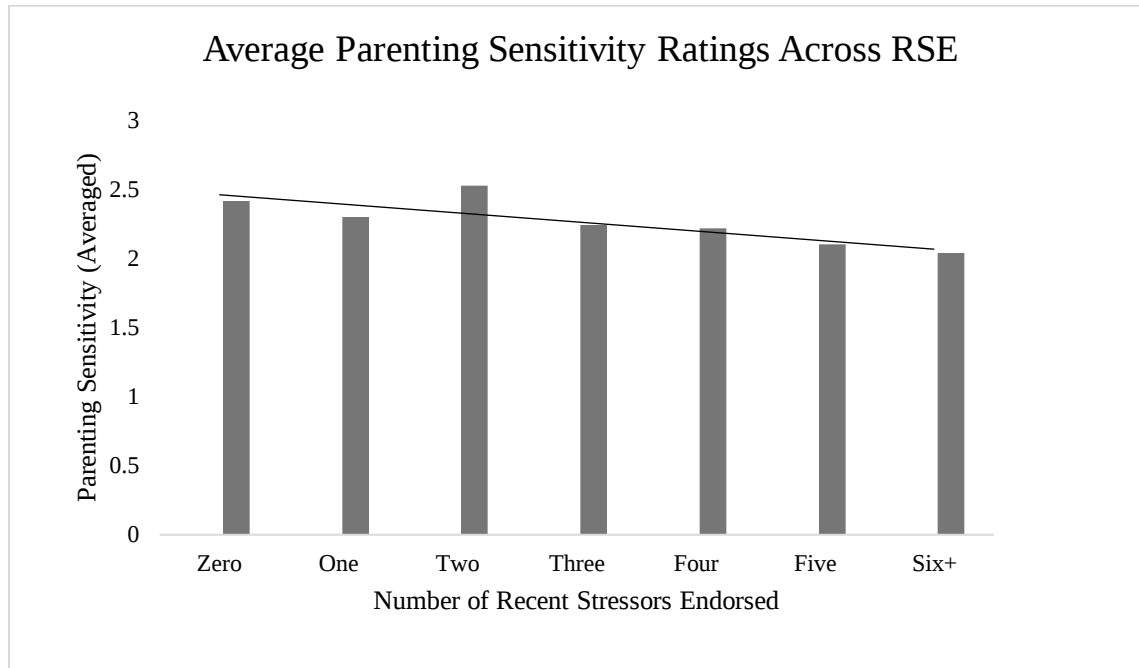


Figure 4

A scatterplot depicting the association between depression symptom severity and the exponentially transformed variable of observed parenting sensitivity (N = 100).

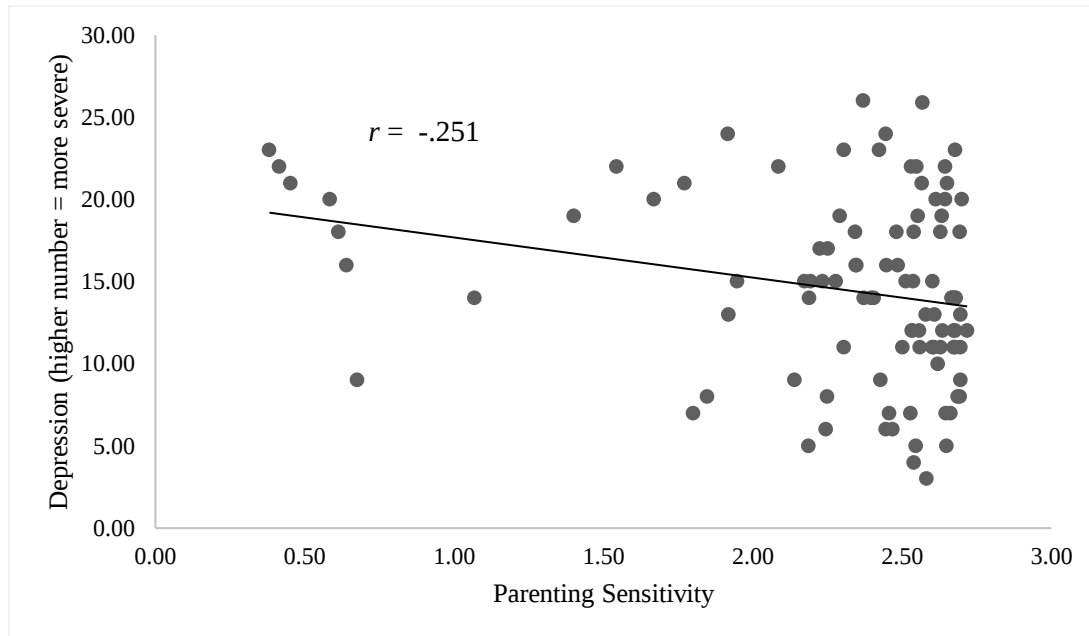


Figure 5

A scatterplot depicting the association between sleep disturbance severity and the exponentially transformed variable of observed parenting sensitivity (N = 101).

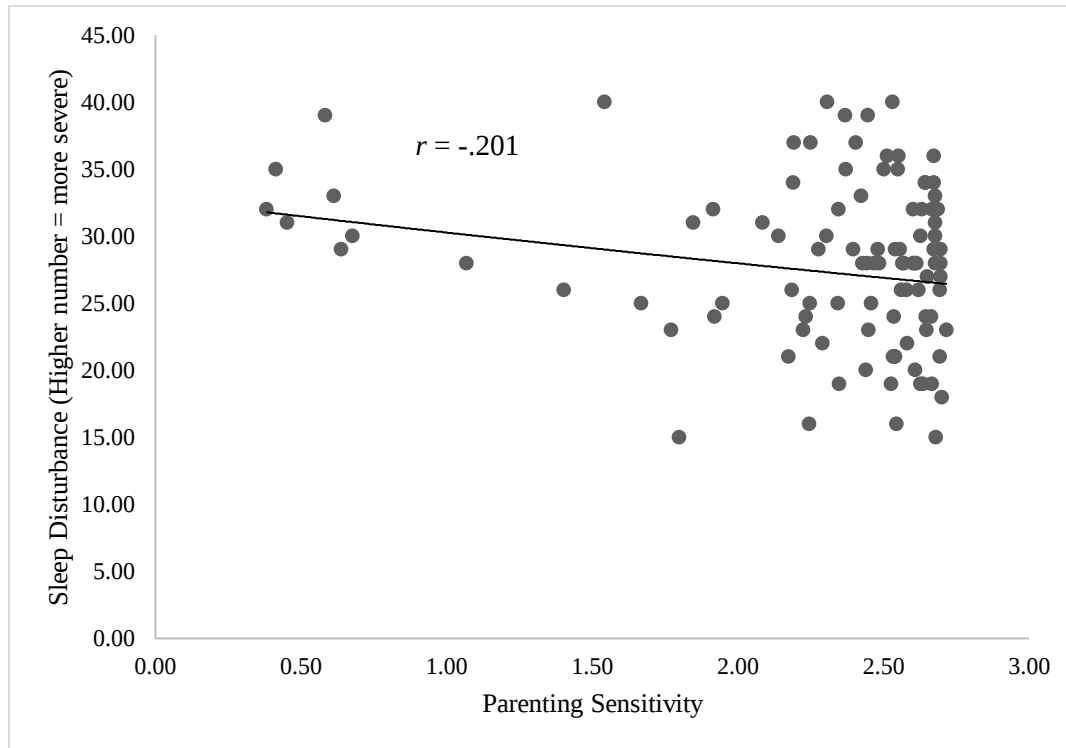
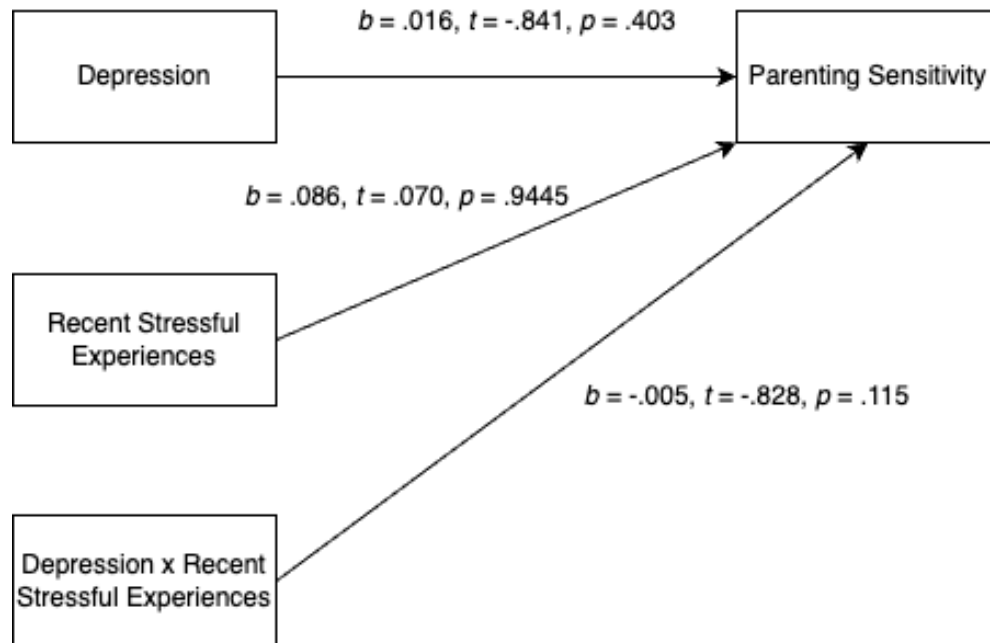


Figure 6

The statistical model demonstrating the moderating effect of RSE on the relation between current mental health outcomes (i.e., depression) and parenting sensitivity.



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Appendix A

Recent Stressful Experiences

This appendix consists of the Recent Stressful Experiences (RSE) measure, authored by Harvard's Centre on the Developing Child.

Recent Stressful Experiences

Which events happened to you in the PAST YEAR (12 months)? (Mark as MANY as apply.)

- ☐ Life-threatening illness or accidental injury to you or someone close to you.
- ☐ Death of someone close to you.
- ☐ Moved to a different home or apartment.
- ☐ Family violence or abuse to you or someone close to you.
- ☐ Had to take care of a seriously ill or disabled member of the family.
- ☐ Started back to school.
- ☐ Separated, divorced or broke up with a spouse or romantic partner.
- ☐ You or someone in your home lost a job or tried to get a job and failed.
- ☐ Government agency funds were cut off for you or someone in your home.
- ☐ Anything else bad happened to you or someone close to you that upset you a lot.
- ☐ None of the above
- ☐ Prefer not to answer