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**DEPRESSED MOTHERS' POSITIVE AFFECT WITH THEIR PARTNERS AND THEIR
INFANTS: EVIDENCE FOR COMPENSATORY EFFECTS**

A Thesis in

Psychology

by

Rachel Alizah Sarah Level

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The thesis of Rachel Alizah Sarah Level was reviewed and approved* by the following:

Ginger A. Moore
Professor of Psychology
Thesis Advisor

Amy D. Marshall
Associate Professor of Psychology

Kristin A. Buss
Associate Professor of Psychology

Melvin M. Mark
Professor of Psychology
Head of the Department of Psychology

*Signatures are on file in the Graduate School

ABSTRACT

Marital conflict and parenting quality have been consistently linked. Previous research has generally found that negative marital relationships are associated, concurrently, with less warm parenting (i.e., spillover theory). However, when examining time-lagged effects, Kouros et al. (2014) found that mothers may compensate *following* unsatisfying marital interactions by investing more positively in parenting. Mothers with depression, who typically experience more marital conflict than other mothers, may show a greater compensatory effect with their infants than other mothers in an effort to regulate the relatively greater negative affect elicited during marital conflict. The current study examined sequential effects in mothers' ($N = 46$) observed negative and positive affect coded during marital discussions and subsequent play interactions with their 7-month-old infants. In addition, mothers' self-reported depressive symptoms were assessed using the BDI-II and tested as a potential moderator of this association. Although all mothers were more positive with their infants than during discussions with partners, higher levels of depressive symptoms were related to a greater increase in positive affect with infants following more negative interactions with partners. Findings support compensatory theory and suggest that depressed mothers may try to attenuate negative affect related to marital relationships by enhancing positive interactions with their infants

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Chapter 1. INTRODUCTION

The quality of marital and parent-child relationships has been consistently linked. Spillover theory posits that parents' dissatisfaction and conflict in their marital relationships lead to less warm and less sensitive parenting (Engfer, 1988), whereas compensatory theory proposes that individuals will invest more positively in parenting when they are dissatisfied with their marital relationships (Belsky, et al. 1991). A meta-analytical review of longitudinal and cross-sectional studies (Erel & Burman, 1995) revealed a moderate positive association ($d = .46$) between marital quality and parent-child relationship quality, supporting spillover rather than compensatory theory. However, this meta-analysis also highlighted several limitations of previous research.

First, the large majority of studies relied on global self-reports of marital and parent-child relationship quality, most often using the same rater, which could inflate an apparent spillover effect. Second, most research has examined associations between global reports of marital and parent-child relationships concurrently, which does not take into account potential temporal associations between them. In fact, Kouros and colleagues (2014) found a positive association between mothers' daily ratings of marital quality and of parent-child relationship quality measured on the same day, suggesting spillover effects. However, when examined from one day to the next, they found a negative association between mothers' ratings of marital quality on one day and ratings of parent-child relationship quality on the next, suggesting that mothers compensated following unsatisfying marital interactions on one day by investing more positively in parenting the next day. Thus, there was evidence to support spillover theory when marital and parent-child relationships were measured concurrently, but evidence for compensatory theory

when the association between marital and parent-child relationships was assessed using time-lagged methods.

The temporal link between negative marital interactions and positive mother-child interactions suggests a regulatory relationship. Mothers may be seeking out positive interactions with their children to regulate negative emotions caused by marital conflict. Indeed, previous literature has shown that eliciting positive emotions in stressful situations is an especially effective emotion regulation strategy and serves to significantly reduce physiological arousal and tension (Yuan, McCarthy, Holley & Levenson, 2010).

For mothers of infants, caregiving and playing with their babies seem to be an especially important source of positive emotions and may counterbalance the demands and stress of caring for young infants. Previous research has shown that mothers experience more positive emotions from positive events experienced with their children than from positive events experienced without their children (Nelson, Kushlev, Dunn, & Lyubomirsky, 2013). Furthermore, neurological studies have found that viewing their own infants' smiling faces is associated with dopaminergic reward related regions being activated in mothers' brains (Strathearn et al., 2008), suggesting that an infant's smile may be a particularly rewarding experience for mothers. Taken together, these findings support the hypothesis that a compensatory relationship between marital quality and mother-child relationship quality may be conceptualized as an emotion regulation process.

To address methodological limitations of prior research and to further examine this emotion regulation theory, the current study used observations of mothers' positive and negative affect, rather than self-report, and incorporated time-lagged methods by first observing mothers

during a conflict discussion with their partners and then during a mother-infant face-to-face play interaction.

Furthermore, previous research on the association between marital and parent-child relationships has typically studied parents with children of varying ages. Because the association between mothers' affect during marital and parent-child interactions could differ depending on the age of the child and the nature of parenting challenges, the current study focused on mothers during the first year postpartum, which is a time when marital conflict increases and marital satisfaction decreases sharply as couples adjust to new parenting responsibilities (Twenge, Campbell, & Foster, 2003). A new baby can lead to a reorganization of social roles, especially for women who are often expected to take on the bulk of primary caregiving (Wolf, 2016). Thus, it is not surprising that mothers with infants show the most pronounced change in marital satisfaction during the first year postpartum (Twenge, et al. 2003).

Maternal Depression

Rates of maternal depression also increase during the postpartum period and are associated with greater marital dissatisfaction (Najman et al., 2014) and less positive mother-infant interactions (Cohn et al., 1990). Therefore, spillover of negative affect between marital and parent-child relationships may be strongest for mothers with depression. However, there is also evidence that, in demographically low-risk samples or with mothers whose depression is not chronic, depressed mothers were as positive with their infants as mothers who were not depressed (Campbell, Cohn, & Meyers, 1995), despite reporting lower marital satisfaction and less support from husbands related to parenting (Campbell, Cohn, Flanagan, Popper, & Meyers, 1992). Furthermore, in a meta-analytic review of the maternal depression literature, Goodman and colleagues (2011) emphasized that depression does not have monolithic effects on parenting.

Rather, depression's negative effect on parenting was moderated by several factors including family income and mother's age. Together, the findings that depression does not negatively affect parenting in all mothers and that some depressed mothers who are less satisfied with their marital relationships can be as positive with their infants as other mothers provide support for a compensatory effect.

Mothers with depression typically have more negative marital relationships than other mothers (Najman et al., 2014) and tend to rely on maladaptive emotion regulation strategies that prolong the experience of negative emotions (Joorman & Gotlib, 2010). Thus, for these mothers in particular, positive emotions from interacting with their infants may help to regulate negative emotions elicited during marital interactions with their partners. In fact, since depression is characteristically associated with fewer experiences of positive emotion, depressed mothers may be especially motivated to seek out the rewards of positive interactions with their infants. In a study examining individual differences in marital conflict, Gotlib and Whiffen (1989) found that individuals with depression were not only more negative and less positive during marital conflict, but also more negative with their spouses after the marital discussion task than other individuals. Given these differences, mothers with depression may particularly benefit from a naturally rewarding positive interaction with their infants and show the most evident compensatory effect.

The Current Study

The current study sought to explore temporal changes in mothers' observed emotion expressions across a marital conflict discussion and subsequent mother-infant play interaction and to examine whether those patterns of change might differ as a function of maternal depression. Mothers were observed interacting with their partners and with their 7-month-old

infants. First, couples were asked to discuss a topic of current conflict for 10 minutes (divided for analysis into two 5-min episodes: Conflict1 and Conflict2) followed by a 5-minute discussion of positive experiences (Pos Exp episode). After a short break to change seating, mothers participated in the Face-to-Face Still Face (FFSF) with their infants, composed of 2-minute normal play (NP), still-face, and reunion episodes. Observing mothers' affect sequentially offered the opportunity to 1) examine differences in mothers' affect between marital and parental contexts, 2) investigate differences between depressed and non-depressed mothers within each context, and 3) examine whether patterns of change between contexts differed for depressed and non-depressed mothers. Based on these expectations, we developed the following hypotheses. Note that some of these hypotheses address change in positive and negative affect between episodes, and some address differences in mean level of affect during each episode as a function of maternal depressive symptoms.

Hypotheses

- 1) Mothers' positive and negative affect will change between episodes consistent with the demands of the marital tasks and mother-infant interaction.
 - a. All mothers will show a decrease in positive affect and an increase in negative affect between Conflict1 and Conflict2 episodes of the marital discussion.
 - b. All mothers will show an increase in positive affect and decrease in negative affect between Conflict2 and the Pos Exp episodes of the marital discussion.
 - c. All mothers will show an increase in positive affect and a decrease in negative affect between the marital Pos Exp and mother-infant play (NP) episode.
- 2) Higher levels of maternal depressive symptoms will be related to greater negative affect and lower positive affect during marital discussions (Conflict1, Conflict2, and Pos Exp

episodes) but not during mother-infant play (NP episode). This is consistent with research that mothers from demographically lower-risk samples who are depressed may not show negative parenting sometimes associated with depression (Campbell, Cohn, & Meyers, 1995; Goodman et al., 2011).

- 3) In support of a compensatory effect, higher levels of maternal depressive symptoms will be related to a greater *increase* in positive affect between the Pos Exp marital discussion and the NP mother-infant play interaction, suggesting mothers with depression may utilize positive emotions generated by interacting with their infants to compensate for or regulate the relatively greater negative emotion elicited during marital conflict.

Chapter 2. METHOD

Participants

Data for the current report were drawn from the New Families Study, an IRB approved study of families during the postpartum period. Mothers ($N = 46$) who had healthy, full-term infants and were currently married or living with the infants' fathers were recruited from rural and urban counties using public birth announcements and a university database that maintains a record of families interested in participating in research studies. Mothers were 20-42 years old ($M = 31.00$, $SD = 5.12$), predominantly married (98%), and middle-class SES (median income in the \$50,00-\$89,000 category). The sample was 89% Caucasian and 6% Mixed Race background. Demographic information was missing for 2 participants. Infants (59% male) were 23-42 weeks old ($M = 33.4$, $SD = 4.36$ weeks). The majority of mothers were multiparous (65%).

Procedure

Mothers, fathers, and their infants were scheduled for 1-hour laboratory visits. Following informed consent, procedures and instructions were described in detail to participants. Mothers

were first asked to interact with their partners in a marital discussion task and then to participate in a Face-to-Face Still Face (FFSF; Tronick et al., 1978) interaction with their infants. After completing the FFSF, families were thanked, debriefed, and financially reimbursed for contributing their time. Participants were video recorded throughout the procedure so that positive and negative affective behaviors could be later micro-coded.

Marital Discussion Task. The marital discussion task (Gottman, 1979) has been widely used in the study of family relationships to assess couples' behavior while discussing topics of current conflict and positive aspects of their relationships. This structured marital discussion task has been shown to be similar to couples' conflict discussions in the home (Schudlich, Papp, & Cummings, 2004) and to elicit emotions representative of those occurring during marital interactions at home (Gottman & Notarius, 2000).

At the beginning of the laboratory visit, couples were provided with a list of common conflict topics (e.g., finances, sharing household responsibilities) and asked to select a topic that was currently causing conflict between them. The research assistant left the room prior to the discussion and instructed the couple via intercom to discuss their conflict topic for 10 minutes. After 10 minutes, couples were prompted via intercom to discuss a recent positive experience related to their family for 5 minutes. The discussion of positive experiences in this task serves to assess mothers' behaviors during a positive marital interaction and represents an opportunity to mitigate any negative emotions that may have been elicited during the conflict discussion (Gottman, 1979).

Because the majority of parents discuss conflicts in front of their young children in the home (Cummings, Goeke-Morey, & Papp, 2003), parents were asked to complete the marital interaction task with infants present. Couples were seated on a couch with the infants in a high

chair next to them. They were instructed to attend to infants as they would at home but to try to leave infants in the seat. Very few infants became fussy during the task and no couples interrupted their discussions to attend to their infants.

Face-to-Face Still Face. After a short break to change seating, mothers participated in the FFSF (Tronick et al., 1978), a well-validated measure of parent and infant behavioral responses during normal play and mildly stressful interactions. In the FFSF, mothers were seated facing their infants, who were securely fastened in an infant high chair in front of them. The FFSF was composed of 3 episodes. Mothers were first instructed to play as they normally would with their infants without any toys for 2 minutes. After the Normal Play episode, mothers were told to hold a neutral expression on their face and not to respond to their infants in any way including through voice, touch, or facial expression. Following the 2-minute Still-Face episode, mothers were instructed to resume interacting with their infants for 2 minutes in a Reunion episode. Mothers were told that they could end the procedure at any time and that if the infants became too distressed, the FFSF would be terminated by the research assistant. Three infants were unable to complete the Reunion episode of the FFSF because they became too distressed. The current study analyzed only data from the Normal Play episode (NP) to conserve data, because significant findings were similar when including data from the Reunion episode.

Measures

Maternal Affect during Marital Discussion Task. Given prior research findings that partners' levels of negative affective behaviors increase across marital conflict discussions (Moore, Du Rocher Schudlich, Propper, Heilbron, & Cox, 2010), the marital conflict discussion was split into two 5-minute episodes (Conflict1 and Conflict2) for coding and analyses.

Mothers' positive and negative facial and verbal expressions were microcoded at 1 second intervals using elements of the Specific Affect Coding System (SPAFF; Coan & Gottman, 2007). This system identifies and categorizes multiple facial, verbal, and gestural behaviors and includes: 1) behaviors thought to reflect negative emotions such as anger, belligerence, contempt, criticism, disgust, fear/tension, sadness, and whining (for example, tightening the lips, making a verbal accusation or speaking in an angry tone, waving a hand in a dismissive gesture); and 2) behaviors thought to reflect positive emotions, including affection, enthusiasm, humor, and validation (for example, smiling, making a joke, patting the partner's arm).

Based on these codes, two new dichotomous variables were created at each second that indicated whether any type of negative or any type of positive expressive behaviors occurred (0 or 1). These dichotomous indicators at each second were separately aggregated across each episode and computed as percentages of time that a mother showed positive or negative affect in each episode (Conflict1, Conflict2, Pos Exp). Inter-rater reliability was computed by double-coding 20% of interactions. Coders reliably distinguished expressive behaviors with an average kappa of .81 ($K = .71-.95$) for the Conflict1 and Conflict2 episodes, and .77 ($K = .70 - .85$) for the Pos Exp episode.

Maternal Affect during FFSF. Mothers' behavior with their infants was coded by trained coders naïve to hypotheses of the current study. To control for infant positivity and negativity during the normal play (NP) episode when examining mothers' affect, infants' behaviors were coded by independent coders. Following prior research (Campbell et al., 1995; Moore, Quigley, Voegtline, DiPietro, 2016), facial affect was coded at 1-s intervals as positive, neutral, or negative and aggregated as percentages of time. If coders were unable to see mothers'

or infants' faces, affect was coded as missing. Coders were initially trained to reliability using a large pool of video recorded FFSF interactions. To ensure that coders maintained inter-observer reliability in the current study, 15% of the interactions were selected randomly and coded by a second coder. Agreement was calculated as coders observing the same behavior within one second of each other and quantified using kappa to correct for chance agreement. Coders reliably distinguished mothers' expressive behaviors with an average kappa of .81 and infants' expressive behaviors with an average kappa of .84 for the NP episode.

Maternal Depressive Symptoms. Mothers' depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report questionnaire that measures symptoms defined by the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-V) for a major depressive episode. Scoring ranges from 0-63, with a score equal to or above 13 indicating a person at risk for clinical depression (Beck et al., 1996). Overall, the BDI-II shows high internal consistency ($\alpha = .91$) and adequate construct validity and test-retest reliability (Wang & Gorenstein, 2012). The BDI-II total score was used in analyses to assess the relation among level of depressive symptoms, mothers' affect during marital discussions, and mothers' affect during mother-infant interactions. In addition, to assess whether risk for clinical levels of depression was related to mothers' affective behaviors, mothers were categorized into depressed ($n = 8$) and non-depressed ($n = 38$) groups based on the recommended BDI-II clinical cutoff of 13.

Mothers' Report of Marital Conflict. To assess whether couples' behavior during the marital conflict discussion in the laboratory setting was related to marital conflict discussions in the home and, therefore, a valid index of the family's affective relationship, mothers' self-report of marital conflict was assessed using the 5-item Conflict subscale of the Braiker and Kelley

(1979) relationship questionnaire. This subscale measures communication of verbal negativity and overt behavioral conflict over the past 2 months, on a scale of 1 (Not at all) to 9 (Very much). A sample item is, “To what extent did you communicate negative feelings toward you partner (e.g., anger, dissatisfaction, frustration)?” Possible total conflict scores range from 5 to 45. Intensity of conflict was measured by assessing the frequency of minor and major conflicts on a scale of 1 (Once a year or less) to 6 (Just about every day). In general, this instrument has shown high internal consistency (.61 to .92) and test-retest reliability (.51 to .81) over a 12-month period in previous research (Belsky et al., 1985). In the current study, the Conflict subscale showed good internal consistency ($\alpha = .76$).

Following Braiker and Kelley (1979), a conflict score that integrated frequency and intensity of conflict was computed for each mother by averaging the ratings of the 5-item conflict subscale and weighting the mean score by intensity of conflict with major conflict double-weighted according to the following formula: (mean conflict x frequency of minor conflict) + (mean conflict x 2 x frequency of major conflict). Thus, the lowest possible weighted conflict score was 3 and the highest possible weighted conflict score was 162.

Data Analytic Plan

Preliminary Analyses. Descriptive correlations were computed for all study variables. Mothers’ positive and negative affect were examined in relation to demographic variables and relevant variables were added to the model as covariates. Based on previous research that has found significant differences in mothers’ expressive behaviors during mother-infant interactions as a function of infant sex and mothers’ parity (Carter, Mayes & Pajer, 1990), differences in mothers’ affect were examined as a function of infant sex and mothers’ parity (primiparous, multiparous) and included as moderators in models if significant differences were found.

Tests of main hypotheses. To examine patterns of change in mothers' affect between episodes (e.g., interacting with their partners during discussions of conflict and positive experiences and then with their infants during face-to-face normal play), repeated measures general linear models (GLM) were tested with episode (Conflict1, Conflict2, Pos Exp, NP) as the repeated measure. To examine whether depression was related to levels of mothers' affect within episodes and to examine whether patterns of change between episodes differed as a function of depression, mothers' total score on the BDI-II was added as a covariate. Additional covariates were added to the model if preliminary analyses indicated a relation with mothers' affect (see Results). Separate models were tested for mothers' percentages of positive and negative affect.

Hypothesis 1: Mothers' positive and negative affect will change between episodes consistent with the demands of the marital tasks and mother-infant interaction. A significant episode main effect would indicate that mothers' affect differed as a function of the type of interaction they were engaging in. Planned repeated within-subjects contrast tests were used to examine significance and direction of change from episode to episode. Mothers' positive affect was expected to decrease between Conflict1 and Conflict2, to increase between Conflict2 and Pos Exp, and to increase between Pos Exp and NP. Mothers' negative affect was expected to increase between Conflict1 and Conflict2, to decrease between Conflict2 and Pos Exp, and to decrease between Pos Exp and NP.

Hypothesis 2: Higher levels of maternal depressive symptoms will be related to lower positive affect and greater negative affect during marital discussions, but not during mother-infant play. A significant main effect for BDI-II score would indicate overall differences in levels of mothers' affect as a function of depression. A significant episode by BDI-II score interaction would indicate that mothers' affect differed as a function of depressive symptoms in

some episodes. If a significant episode by BDI-II score interaction was found, one-way ANOVAS were used to test differences in affect between mothers who were in the depressed group (BDI total score > 13) and those who were in the non-depressed group (BDI total score < 14) in positive and in negative affect separately by episode (Conflict1, Conflict2, Pos Exp, NP). The decision to probe the interaction using depression as a categorical variable was to better understand the clinical importance of findings.

Hypothesis 3: Higher levels of maternal depressive symptoms will be related to a greater increase in positive affect between the marital discussion (Pos Exp) and mother-infant interaction (NP), i.e., a compensatory effect. A significant within-subjects episode by BDI-II score interaction would indicate that higher levels of depressive symptoms were related to differential change between episodes. Planned repeated contrast tests were used to test if higher levels of depressive symptoms were related to a significantly greater increase in mothers' positive affect between the Pos Exp and NP episode.

Chapter 3. RESULTS

Preliminary Analyses

Descriptive statistics (Table 1) were computed for study variables. As is typical in studies of mother-infant interaction, most mothers showed no negative affect when playing with their infants. Mothers' negative affect during the Pos Exp showed a slight right skewness. All other variables were normally distributed. One-way ANOVAs were conducted to test whether mothers' positive and negative affect within each interactive episode differed by parity or infant sex. Primiparous mothers ($N = 16$) showed higher levels of positive affect and lower levels of negative affect (Positive $M = .55$; Negative $M = .17$) than multiparous mothers (Positive $M = .39$; Negative $M = .22$) during the Pos Exp episode, $F(1, 43) = 7.47, p < .05$. Mothers of boys ($N = 27$)

were significantly more positive ($M = .50$) during the Pos Exp episode than mothers of girls ($M = .38$), $F(1,43) = 4.54, p < .05$. However, when added to repeated-measures GLMs testing the main hypotheses, neither parity nor infant sex was found to have a significant effect and did not significantly change the results of our main analyses. Therefore, results for those models are reported below without including maternal parity or infant sex.

Correlations among study variables were computed. Mothers' age, income, and education level were not significantly correlated with mothers' affect in any episode. As seen in Table 2, mothers' total BDI-II score was positively associated with report of marital conflict in the home and with greater negative affect in the Conflict1 and Conflict2 episodes. Mothers' report of marital conflict in the home was significantly correlated with mothers' negative affect in Conflict1, supporting the external validity of the laboratory conflict discussion. Mothers' positive and negative affect were stable across marital conflict episodes. Positive and negative affect were uncorrelated within the Conflict1 and Conflict2 episodes and were negatively correlated within the Pos Exp and the NP episodes. Mothers' negative affect in Conflict1 and Conflict2 episodes was negatively correlated with infants' negative affect in the NP episode. Mothers' affect was not correlated with infants' affect during the NP episode, although the magnitude of the correlations was similar to that found in other studies of mother-infant interaction in the FFSF (Campbell et al., 1995; Moore et al., 2016). To assess effects of infant affect in the NP episode on mothers' positive and negative affect in tests of main hypotheses, infant positive and negative affect were added to the respective models. A significant effect of infant negative affect in NP was found only in the model testing mothers' negative affect, $F(3, 41) = 3.90, p < .05, \eta^2 = .09$. Therefore, results for the mothers' negative affect model are reported including infant negative affect (see below).

Tests of Main Hypotheses

Hypothesis 1. A significant main episode effect was found in the positive affect model, $F(3, 41) = 75.62, p < .01, \eta^2 = .64$ and negative affect model, $F(3, 41) = 38.75, p < .01, \eta^2 = .49$, which confirmed that mothers' positive and negative affect changed as a function of the type of interaction they were engaging in.

For positive affect, planned repeated within-subjects contrast tests showed significant change between Conflict2 and Pos Exp episodes, $F(1, 42) = 29.86, p < .01$, and between Pos Exp and NP episodes, $F(1, 42) = 29.86, p < .01$, such that mothers' positive affect increased between Conflict2 and Pos Exp, and increased again between Pos Exp and NP (Figure 1).

For negative affect, planned repeated within-subjects contrast tests showed significant change between Conflict2 and Pos Exp episodes, $F(1, 42) = 19.87, p < .01$, and Pos Exp and NP, $F(1, 42) = 24.76, p < .01$, such that mothers' negative affect remained constant between Conflict1 and Conflict2, decreased between Conflict2 and Pos Exp, and decreased between Pos Exp and NP (Figure 2). A significant between-subjects effect of infant negative affect in NP was also found, $F(1, 43) = 4.61, p < .05, \eta^2 = .10$, indicating that mothers who showed more negative affect overall had infants who were more negative in the NP episode.

Hypothesis 2. A significant episode by BDI-II score interaction was found in the positive affect model, $F(3, 41) = 3.31, p < .05, \eta^2 = .07$, but not negative affect model. As seen in Table 3, follow-up one-way ANOVAs revealed significant differences in positive and negative affect between mothers in the depressed group (BDI total score >13) and those who were in the non-depressed group (BDI total score <14). Mothers in the depressed group, on average, were more negative during Conflict2, $F(1, 44) = 5.22, p < .05$ and less positive with their partners in the Pos Exp episode than mothers in the non-depressed group, $F(1, 44) = 5.12, p < .05$. No significant

differences were found between groups in the mother-infant play interaction. In sum, as hypothesized, higher levels of maternal depressive symptoms were related to lower positive affect and greater negative affect during marital discussions but not during mother-infant play.

Hypothesis 3. In the positive affect model, a significant within-subjects episode by BDI-II score interaction showed a significant difference between the Pos Exp and NP episode, $F(1, 41) = 6.29, p < .05$, such that higher levels of depressive symptoms were related to a significantly greater increase in positive affect between the Pos Exp marital discussion and NP interactions. Thus, these findings supported the hypothesis of a compensatory effect for mothers with higher levels of depressive symptoms.

Chapter 4. DISCUSSION

Most research studying mothers during the postpartum period starts with the assumption that mothers with higher levels of depression will be more negative when interacting with their partners *and* their infants compared to other mothers (i.e., spillover theory). However, not all mothers who are depressed show negative effects in their parenting, as emphasized in recent conceptualizations of maternal depression that recognize the need to move beyond main effect models (Goodman et al., 2011). Therefore, we hypothesized that interacting with their infants could be a very positive experience for mothers with depression even if their marital relationships were not as positive as other mothers, consistent with a compensatory model of the association between marital and parenting relationships. Based on research suggesting that considering the temporal associations between marital interactions and mother-infant interactions provides a different account of the association between the two kinds of interaction (Kouros et al., 2014), the current study used observations of mothers' positive and negative affect during a conflict discussion with their partners, followed by a brief discussion of a positive experience,

and then a mother-infant play interaction. This design addressed methodological limitations of prior research by examining observations of maternal behavior rather than relying on global self-report data and by elucidating temporal associations between marital and mother-infant interactions.

As expected, mothers' positive and negative affect changed as a function of the interaction they were engaging in. After discussing a topic of current conflict with their partners, mothers became less negative and more positive when the topic turned to positive experiences. They became even more positive and most showed no negative affect at all when they shifted to playing with their infants, which is coherent with the different demands of interacting with an adult partner and interacting with an infant.

Consistent with prior research (Gotlib & Whiffen, 1989; Najman et al., 2014), higher levels of depressive symptoms were associated with less positive affect and more negative affect when interacting with partners and with greater marital conflict in the home. Although all mothers were more positive with their infants than during discussions with partners, mothers who showed clinical levels of depressive symptoms showed a greater increase in positive affect with infants following less positive and more negative interactions with partners. This is particularly notable because while spillover theory suggests that more negative marital interactions would be associated with less positive mother-infant interactions, our findings suggested that mothers experiencing depression may compensate for negative marital relationships by heightening positive emotions in the mother-infant relationship.

In fact, given that we observed mothers' affect with their infants right after we observed their affect during a marital interaction, it is possible that mothers with higher levels of depressive symptoms may have used the positive emotions elicited when interacting with their

infants to compensate for or regulate the relatively greater negative emotions experienced during marital conflict discussions. Indeed, previous research has documented that positive emotions may “undo” the effects of negative emotions (Fredrickson, Mancuso, Branigan, & Tugade, 2000). The pleasurable experience of positive emotions with their infants may function as a method of self-regulation that negates or diminishes the unpleasant feelings associated with negative emotions that come up in their marital relationships. It is possible that mothers with lower levels of depressive symptoms are better able to regulate their negative emotions with their partners than mothers with higher levels of depressive symptoms, and, indeed, they showed more positive emotion when discussing positive experiences with their partners. Thus, they may not have needed to rely as heavily on the positive emotions elicited during the mother-infant play to restore a sense of well-being.

While maternal positivity is generally considered to be related to better infant outcomes, growing evidence suggests that very high levels of maternal positivity may be a marker of mother-infant interactions that are lower in synchrony (Moore et al., 2016). Mothers expressing very high levels of positive affect may not be as responsive to infant cues. Thus, while our study has emphasized the compensatory nature of these interactions, it is important to note that greater maternal positivity may not always indicate sensitive and optimal responsiveness to infants.

Overall, our study findings are consistent with compensatory theory rather than spillover theory when investigating links between marital relationships and parenting and extended preceding work in several ways. First, the study used observations of mothers’ positive and negative affect during marital conflict and positive experiences discussions and a subsequent mother-infant play interaction instead of relying on concurrent global self-report or daily diary data. Second, the time-lagged design in which mothers were observed first interacting with their

partners and subsequently with their infants afforded the opportunity to probe temporal associations as in the Kouros, et al. (2014) study. Furthermore, whereas previous studies have used designs with parents of children of many different ages, the current study focused on parents at the same developmental stage, that is, parents of young infants, helping to standardize the types of parenting experiences and challenges that could have an impact on the association between marital and parenting relationships. Finally, the study explored potential compensatory effects in relation to maternal depression. This is one of the first studies examining the temporal associations between marital interactions and mother-infant interactions as a regulatory process, which allowed for a novel functional analysis of compensatory theory.

Despite the novelty of this study, there were some limitations. First, the sample was relatively small and composed of predominantly middle class, Caucasian women from rural and small city areas. Findings may vary when examining women of different ethnicities, socioeconomic levels, and geographic regions. Second, the mean level of depressive symptoms in the sample was relatively low. Higher levels of clinical depression may result in different interactive patterns with partners and infants. However, we examined differences in patterns of positive and negative affect between mothers who met the clinical threshold for depression and those who did not, and, even though it was a small sample, the results suggest our findings have clinical significance. Third, our study did not include analyses of fathers' affect. Examination of fathers' affective contributions to the marital interaction may elucidate whether mothers' affective rebound was a reflection of a negative partner, an attempt to regulate negative emotions elicited by the interaction, or both. Future studies may likely benefit from incorporating different measures that are likely involved in the social regulation of emotion. For example, oxytocin has recently emerged as an important mediator of emotion regulation during mother-infant

interactions (Seltzer et al., 2014). Including measures of oxytocin during marital and mother-infant interactions may reveal unique regulatory processes occurring at the physiological level.

Previous research has tended to focus on the negative effects of depression on parenting, while overlooking evidence that not all mothers with depression show negative effects on parenting. The current findings suggest that mothers with higher levels of depressive symptoms may particularly benefit from positive emotions elicited when playing with their infants following negative marital interactions. Findings from this study support the need to surpass main effect models of depression in order to better understand the effect of depression on family systems.

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APPENDIX A

Table 1.
Descriptive statistics for study variables.

| | <i>M (SD)</i> <i>N = 46</i> | Minimum | Maximum | Skewness | Kurtosis |
|-----------------------------|--------------------------------|---------|---------|----------|----------|
| BDI-II Total Score | 7.78 (6.97) | .00 | 26.00 | 1.21 | 0.84 |
| Report of Marital Conflict | 33.40 (23.14) | 3.60 | 86.80 | 0.95 | -.10 |
| % Positive Affect Conflict1 | .31 (.21) | .02 | .97 | 1.02 | 0.72 |
| % Positive Affect Conflict2 | .28 (.20) | .02 | .99 | 1.28 | 2.30 |
| % Positive Affect Pos Exp | .45 (.19) | .13 | 1.00 | 0.64 | 0.18 |
| % Positive Affect NP | .79 (.19) | .21 | 1.00 | -1.11 | 0.50 |
| % Negative Affect Conflict1 | .40 (.19) | .05 | .82 | 0.30 | -0.52 |
| % Negative Affect Conflict2 | .44 (.22) | .05 | .96 | 0.53 | -0.11 |
| % Negative Affect Pos Exp | .20 (.13) | .01 | .69 | 1.49 | 3.42 |
| % Negative Affect NP | .01 (.02) | .00 | .13 | 4.96 | 27.34 |
| Infant % Positive Affect NP | .20 (.25) | .00 | .84 | 0.47 | -0.07 |
| Infant % Negative Affect NP | .34 (.20) | .00 | .89 | 1.48 | 1.21 |

Note. Conflict1 = first 5 minutes of conflict discussion with partner; Conflict2 = second 5 minutes of conflict discussion with partner; Pos Exp = 5-min discussion about positive family experiences with partner; NP = 2-min mother-infant normal play episode of the FFSF. * $p < .05$, ** $p < .01$.

Table 2.
Correlations among study variables.

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. |
|---------------------------------|----|-------|-----|-------|-------|-----|------|-------|-------|-------|------|--------|
| 1. BDI-II Total Score | -- | .41** | .01 | -.04 | -.26 | .24 | .23 | .30* | .30* | -.05 | -.02 | -.29 |
| 2. Report of Marital Conflict | | -- | .00 | -.07 | -.12 | .03 | .31* | .28 | .00 | -.04 | .04 | -.18 |
| 3. % Positive Affect Conflict1 | | | -- | .81** | .50** | .20 | .00 | -.12 | -.19 | -.21 | .23 | .00 |
| 4. % Positive Affect Conflict2 | | | | -- | .63** | .14 | .06 | -.14 | -.21 | -.16 | -.01 | -.01 |
| 5. % Positive Affect Pos Exp | | | | | -- | .00 | .09 | -.10 | -.31* | .03 | .07 | -.24 |
| 6. % Positive Affect NP | | | | | | -- | -.10 | -.08 | -.17 | .51** | .29 | -.15 |
| 7. % Negative Affect Conflict1 | | | | | | | -- | .79** | .46** | .06 | .06 | -.44** |
| 8. % Negative Affect Conflict2 | | | | | | | | -- | .47** | .15 | -.05 | -.33* |
| 9. % Negative Affect Pos Exp | | | | | | | | | -- | .08 | .04 | -.21 |
| 10. % Negative Affect NP | | | | | | | | | | -- | -.25 | .27 |
| 11. Infant % Positive Affect NP | | | | | | | | | | | -- | -.38* |
| 12. Infant % Negative Affect NP | | | | | | | | | | | | -- |

Note. Conflict1 = first 5-min of conflict discussion with partner; Conflict2 = second 5-min of conflict discussion with partner; Pos Exp = 5-min discussion about positive family experiences with partner; NP = mother-infant normal play episode of the FFSF. * $p < .05$, ** $p < .01$.

Table 3.

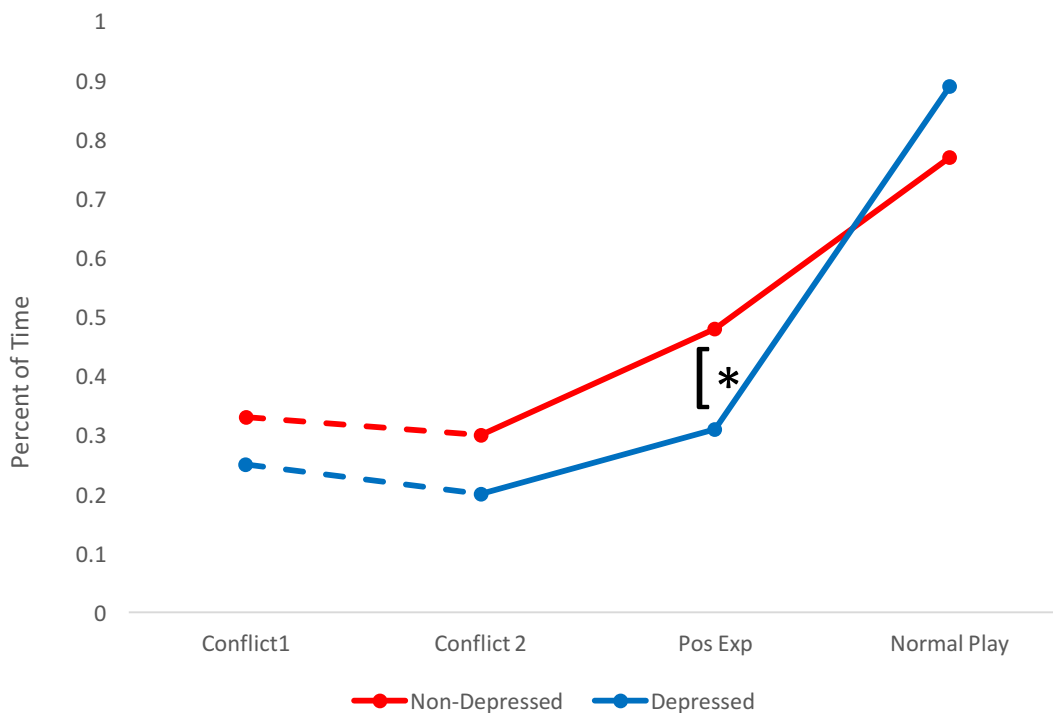
Descriptive statistics of study variables by non-depressed and depressed groups.

| | Non-depressed (BDI-II < 13) <i>N</i> = 38 <i>M</i> (<i>SD</i>) | Depressed (BDI-II > 12) <i>N</i> = 8 <i>M</i> (<i>SD</i>) | <i>F</i> (1, 44) | <i>p</i> |
|-----------------------------|---|--|------------------|----------|
| BDI-II Total Score | 5.11 (3.58) | 20.50 (4.54) | 111.59 | .00** |
| Report of Marital Conflict | 28.90 (18.1) | 54.78 (30.64) | 9.90 | .00** |
| % Positive Affect Conflict1 | .33 (.21) | .25 (.22) | 1.01 | .32 |
| % Positive Affect Conflict2 | .30 (.20) | .20 (.17) | 1.54 | .22 |
| % Positive Affect Pos Exp | .48 (.19) | .31 (.15) | 5.12 | .03* |
| % Positive Affect NP | .77 (.20) | .89 (.15) | 1.64 | .21 |
| % Negative Affect Conflict1 | .39 (.18) | .50 (.20) | 2.85 | .10 |
| % Negative Affect Conflict2 | .41 (.20) | .59 (.23) | 5.22 | .03* |
| % Negative Affect Pos Exp | .18 (.10) | .29 (.21) | 4.71 | .04* |
| % Negative Affect NP | .01 (.02) | .01 (.01) | 0.01 | .94 |
| Infant % Positive Affect NP | .35 (.20) | .32 (.21) | 0.09 | .76 |
| Infant % Negative Affect NP | .24 (.25) | .01 (.03) | 6.39 | .02* |

Note. Conflict 1 = first 5 minutes of conflict discussion with partner; Conflict 2 = second 5 minutes of conflict discussion with partner; Pos Exp = 5-min discussion about positive family experiences with partner; Normal Play = 2-min mother-infant play episode of the FFSF. **p* < .05, ***p* < .01.

Figure 1.

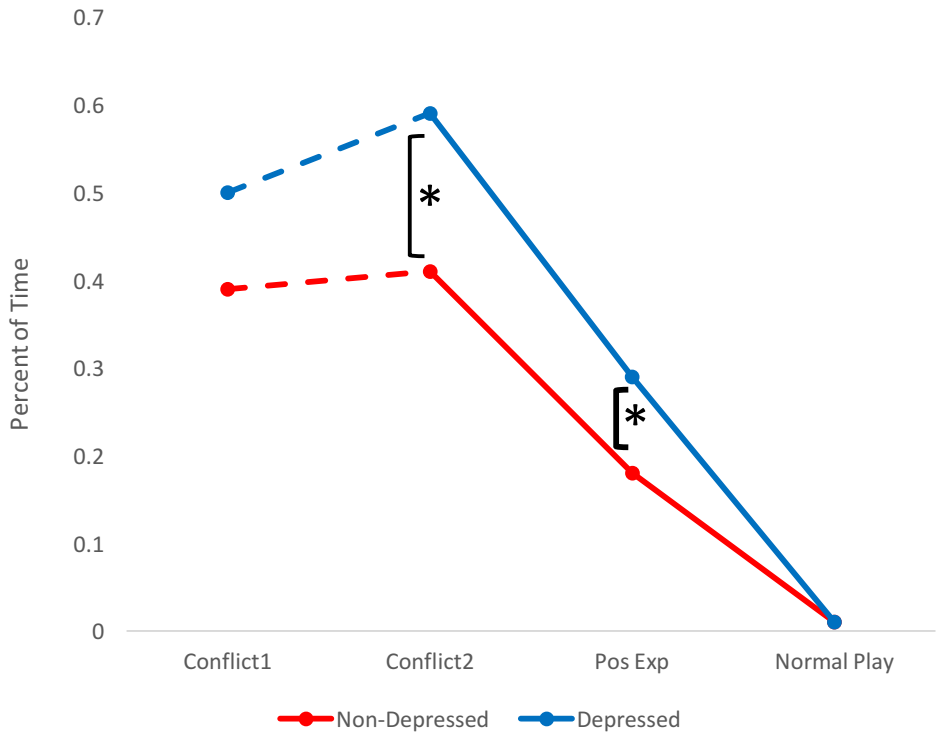
Change in mothers' positive affect across episodes of marital discussions with partners and with infants during the Face-to-Face Still-Face



Note. Solid lines indicate significant change between episodes. As expected, positive affect increased between the Pos Exp discussion with partners and the Normal Play episode of the FFSF for depressed, $t(7) = -7.52, p < .001$, and non-depressed mothers, $t(37) = -6.67, p < .001$. However, depressed mothers showed a greater increase in positive affect between the Pos Exp discussion with partners and the Normal Play episode of the FFSF than non-depressed mothers, $F(1, 42) = 4.00, p < .05, \eta^2 = .20$.

Figure 2.

Change in mothers' negative affect across episodes of marital discussions with partners and with infants during the Face-to-Face Still-Face



Note. Solid lines indicate significant change between episodes. Although depressed and non-depressed mothers differed in levels of negative affect during the Conflict2 and Post Exp episodes, they did not differ in rates of change between episodes.