THE INFLUENCE OF POSTPARTUM DEPRESSION ON RELATIONSHIP SATISFACTION

A thesis submitted
to Kent State University in partial fulfillment of the requirements for the degree of Master of Arts

by

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# TABLE OF CONTENTS

LIST OF FIGURES ................................................................. iv
LIST OF TABLES ............................................................... v
ACKNOWLEDGMENTS .......................................................... vi

CHAPTER                                  Page

I INTRODUCTION ................................................................. 1
  Relationship Satisfaction and the Transition to Parenthood .................. 2
  Postpartum Depression and Relationship Satisfaction .......................... 3
  A Person-Centered Approach to PPD and Relationship Satisfaction ........ 8
  The Current Study ........................................................... 9

II METHODS ................................................................. 13
  Participants ................................................................. 13
  Procedure ................................................................. 13
  Materials ................................................................. 15
  Data Analysis .............................................................. 17

III RESULTS ................................................................. 19
  Cross-sectional APIM models ................................................. 19
  Longitudinal APIM Models .................................................. 27
  Person-centered Analyses ................................................... 31
  Mothers’ Latent Class Growth Analyses .................................... 33
  Fathers’ Latent Class Growth Analyses .................................... 37

IV DISCUSSION ................................................................. 40

REFERENCES ................................................................. 47

APPENDICES ................................................................. 53

APPENDIX A BABY T.I.M.E. MEASURES .................................... 54
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cross Sectional APIM model at one-months postpartum</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Cross Sectional APIM model at four-months postpartum</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Cross Sectional APIM model at nine-months postpartum</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>Longitudinal APIM model predicting relationship satisfaction at four-months postpartum</td>
<td>29</td>
</tr>
<tr>
<td>5</td>
<td>Longitudinal APIM model predicting relationship satisfaction at nine-months postpartum</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>Mothers’ growth trajectories on relationship satisfaction</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>From pregnancy to nine-months postpartum</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fathers’ growth trajectories on relationship satisfaction</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>From pregnancy to nine-months postpartum</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Demographic characteristics of the sample</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Descriptive Statistics for major study variables</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Bivariate correlations for major study variables</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Model fit indices for unconditional latent class growth analyses</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Growth factor means and standard errors for relationship satisfaction sub-groups</td>
<td>34</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>
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CHAPTER I

INTRODUCTION

Life is tough for new parents. While a baby comes with many joys, it also comes with countless responsibilities, relationship changes, and sleepless nights. The birth of a child is a significant transition for parents, and this transition can be hard on the spousal relationship. Numerous studies demonstrate parents (on average) experience small to moderate declines in relationship satisfaction across the transition to parenthood (see Mitnick, Heyman & Smith Slep, 2009 for a review). Though a decline in new parents’ relationship satisfaction is well-established, the reasons for this decline are less clear. To shed light on the reasons for the decline, researchers have recently examined a number of possible variables (e.g. division of labor, cognitive factors) that may influence relationship satisfaction during the transition to parenthood (e.g. Dew & Wilcox, 2011; Shapiro, Gottman & Carrere, 2000). Yet, one potential factor is noticeably absent from these studies: postpartum depression (PPD). The theoretical possibility for PPD to influence relationship satisfaction during the transition to parenthood is clear: PPD afflicts many new parents, and it may generate stress in the marital relationship (Davila, Bradbury, Cohan & Tochluk, 1997) or burden the partner of the depressed individual (Benazon & Coyne, 2000). Furthermore, although many studies have established a cross-sectional association between relationship satisfaction and PPD where relationship satisfaction is the predictor and PPD is the outcome (Beck, 2001), this cross-sectional association leaves many aspects of the link, such as the temporal relationship, unclear.
Currently, no studies have systematically examined the link between PPD and relationship satisfaction. Using dyadic, longitudinal, and person-centered methods, the current study fills the gap in the literature by examining the potential for postpartum depression to negatively influence relationship satisfaction during the transition to parenthood.

**Relationship satisfaction and the transition to parenthood**

A small to moderate decline in relationship satisfaction for couples giving birth to their first child is well-established (Lawrence, Rothman, Cobb, Rothman & Bradbury, 2008; Mitnick, et al., 2009). Although some debate exists as to whether or not relationship satisfaction declines more for new parents than for their non-parent counterparts (Mitnick, et al., 2009), recent evidence sheds considerable light on the subject. As part of a 5-year longitudinal study, Lawrence and colleagues (2008) established new parents’ relationship satisfaction demonstrates steeper declines than the relationship satisfaction of non-parents, even after taking into account a number of potentially confounding variables (e.g. marital duration and degree of pregnancy planning). In line with the plethora of studies documenting a decline in relationship satisfaction for first-time parents (Mitnick, et al, 2009), Lawrence and colleagues (2008) concluded the transition to parenthood produces detrimental changes for relationship satisfaction.

Despite the large number of studies establishing a decline in relationship satisfaction for first-time parents, few have looked at the possible reasons for this decline. Of the studies that do exist, factors put forth to explain the decline include changes in the
division of labor, changes in the amount of time spent with spouse, and cognitive factors, such as how couples conceptualize their relationship (Dew & Wilcox, 2011; Shapiro, et al., 2000). Though these variables are important, one variable that has the potential to affect postpartum relationship satisfaction is noticeably absent from the extant literature: postpartum depression.¹

Postpartum Depression and Relationship Satisfaction

Postpartum depression is a serious mood disturbance that is estimated to occur in approximately 13% of mothers (O’Hara & Swain, 1996) and 10% of fathers (Paulson & Bazemore, 2010). PPD is characterized by guilt, loneliness, anxiety, and a loss of control (Beck, 1992; Beck, 1993), all of which lead to the feeling that the parent is irrevocably disconnected from the child (Beck, 1996). Negative emotionality, guilt, and anxiety tend to overwhelm parents experiencing PPD, and affect their feelings about and interactions with their children (Cohn, Campbell, Matias & Hopkins, 1990; Paulson, Dauber & Leiferman, 2006). PPD is distinct from general depression in that it specifically relates to the baby and parenting (Beck, 1993; Beck, 1996; Beck & Gable, 2000). Such a serious mood disturbance has implications not just for the individual suffering from PPD, but also for that person’s spousal relationship.

Based on prior theory and research, there is good reason to believe PPD affects relationship satisfaction. Specifically, there are two mechanisms by which PPD may

¹ Postpartum depression may work in conjunction with or through these variables to influence relationship satisfaction during the transition to parenthood. Though beyond the scope of the current study, it would be interesting to explore how postpartum depression might interact with other variables to influence relationship satisfaction.
affect relationship satisfaction: stress generation and partner burden. For the purposes of the current study I do not aim to test these mechanisms; instead, I discuss them in order to establish a firm theoretical foundation for how PPD might influence relationship satisfaction.

The first mechanism by which PPD might influence relationship satisfaction is stress generation, which suggests depressed people tend to create dysphoric, negative experiences in their interpersonal interactions (Davila, Bradbury, Cohan & Tochluk, 1997). By creating negative experiences, depressed people foster stress in their relationships, which negatively affects both the depressed individual and their partner. Studies on depression provide evidence for stress generation in a variety of samples, including children, adolescents, and adults (Davila, Hammen, Burge, Paley, & Daley, 1995; Pianta & Egeland, 1994; Sandier, Tein, & West, 1994). Germane to the current study, Davila and colleagues (1997) tested the usefulness of the stress generation hypothesis in marriage, and found stress generation was particularly applicable for women, as their depressive symptoms influenced subsequent marital distress. With regards to PPD specifically, a mother or father suffering from depressed mood, parental guilt, or loss of interest due to PPD is likely to interact with their partner in a way that is less positive and creates more stress in the relationship. In this way, stress-generating behaviors on the part of the individual suffering from PPD are likely to be detrimental to relationship satisfaction for both the individual and his/her partner.

A second way PPD might influence relationship satisfaction is through partner burden. Many researchers have argued depression places burden, strain, and anxiety on
the partner of the depressed individual (e.g. Benazon & Coyne, 2000; Whisman & Uebelacker, 2009). Partners of depressed people can be burdened by a number of aspects of the depression, including a decrease in leisure activities enjoyed with the partner, their partner’s lack of energy, a fall in income or household contribution by the depressed partner, or because of worry and fear for the partner’s well-being. All of these burdens create stress for the partner of the depressed individual and likely lead to more negative overall feelings about the relationship (Benazon & Coyne, 2000).

There may be additional burdens placed on partners of individuals with PPD. A new parent with PPD may experience anxiety about or loss of interest in parenting and household duties, burdening their partner by forcing them to compensate for the depressed parent who is no longer contributing significantly to the household. Additionally, there is clear evidence that PPD negatively affects the interaction style of mothers and fathers with their children, such that parents afflicted with PPD demonstrate more anger and irritation, and less interest toward their baby (Cohn, et al., 1990; Paulson, et al., 2006). Partners of the individual with PPD may be frustrated or perplexed by the depressed parent’s interactions with the baby, and feel more negatively about their partner and the relationship as a result. Thus, both stress generation and partner burden provide good theoretical reason to believe PPD might affect the relationship satisfaction of both the depressed individual and their spouse.

The theoretical possibility for PPD to influence relationship satisfaction is clear; but, are there empirical studies exploring PPD’s influence on relationship satisfaction? Numerous studies have documented a cross-sectional link between relationship
satisfaction and PPD. Using meta-analysis, Beck (2001) estimated a mean effect size of .39 across 14 studies examining the association between relationship satisfaction and PPD, where relationship satisfaction is the predictor and PPD is the outcome. A number of longitudinal studies have also examined the relationship between pre-natal relationship satisfaction and subsequent incidence of PPD. Results indicate that lower levels of relationship satisfaction prenatally are associated with higher levels of PPD. For example, Hock, Schirtzinger, Lutz, and Widaman (1995) found that mothers’ pre-natal levels of relationship satisfaction predicted their PPD at nine-months postpartum. Similarly, in a study by Gotlib, Whiffen, Wallace, and Mount (1991), women who reported lower levels of relationship satisfaction during pregnancy were more likely to develop PPD. Surprisingly, given all the research in this area, little empirical attention has been paid to PPD’s influence on relationship satisfaction. As a result little is known about whether PPD impacts relationship satisfaction across time. To our knowledge, no empirical studies exist which longitudinally examine the effects of PPD on relationship satisfaction.

Only one empirical study has attempted to document the impact of depression in the postpartum period on relationship satisfaction in a systematic or longitudinal way. Whisman, Davila, and Goodman (2011) examined a sample of women with a history of major depression from the first month of pregnancy until six months postpartum. Using time-lagged analyses, the authors found that depressive symptoms negatively predicted subsequent relationship satisfaction during pregnancy and the postpartum period. Though important, there are a number of reasons why the study by Whisman and
colleagues (2011) is limited. First, the authors used a measure of general depression – the Beck Depression Inventory, Second Edition (BDI-II) – to assess depression in the postpartum period. While the BDI-II is a well-validated and reliable measure of general depression, its use (along with other general depression inventories such as the CES-D) in assessing PPD specifically has been criticized (Beck & Gable, 2000). One problem is that many general depression inventories contain items assessing symptoms which are a normal part of the postpartum period, such as sleep disturbances and fatigue. Furthermore, because the BDI-II does not include items specific to parenting, the baby, or to the postpartum period, its construct validity in measuring PPD – which is conceptually distinct from general depression – is lacking. Thus, instead of assessing PPD, this study assessed general depression occurring during the postpartum period.

Another major limitation of the Whisman and colleagues (2011) study is that fathers were not included. Indeed, even among the plethora of cross-sectional studies reviewed in Beck’s (2001) meta-analysis examining the association between PPD and relationship satisfaction none (to our knowledge) have included both mothers and fathers in their analyses. Omission of one partner is particularly problematic in light of a prominent theory in the marriage and family literature: the Actor Partner Interdependence Model (APIM; Cook & Kenny, 2005). APIM suggests the attitudes and outcomes of those in intimate and familial relationships are fundamentally interconnected, such that it is impossible to understand a mother’s outcomes without also examining her partner (and vice versa). Maternal and paternal PPD and relationship satisfaction are interdependent and influence each other (e.g. Paulson & Bazemore, 2010); thus, omission of fathers
poses serious problems for fully understanding PPD and relationship satisfaction, even at a cross-sectional level. Without proper understanding of both parents’ mental and relationship health, any conclusions about how maternal relationship satisfaction changes as a function of PPD are limited.

A person-centered approach to PPD and relationship satisfaction

One final limitation of the current literature is both a conceptual and analytic one. Until now our exploration of PPD and relationship satisfaction has been largely variable-centered: we have focused on describing how two variables are related across an entire sample. Indeed, the large majority of the extant literature uses this variable-centered approach. Yet, person-centered approaches – which focus on differences between individuals, and classify individuals into groups where they are more similar to others in their group than to others outside of their group – are particularly applicable to the current topic. When considering relationship satisfaction during the transition to parenthood, Belsky and Rovine (1990) pointed out the importance of recognizing that not all parents or couples experience the transition in the same way. While, on average, new parents demonstrate declines in relationship satisfaction, across individuals (or couples) there is likely considerable variability in patterns of change. That is, not all parents necessarily change for the worse. Indeed, Belsky and Rovine (1990) identified 4 different patterns of change on relationship satisfaction during the transition to parenthood, which included slightly increasing, stable, decreasing, and decreasing steeply. These heterogeneous patterns of change support the notion that not all parents
experience the transition the same way. Thus, new parents need to be studied in a way that accounts for inter-individual differences.

The specific research question of interest – PPD’s influence on relationship satisfaction – provides even more impetus to utilize person-centered analyses in conjunction with variable-centered analyses. As mentioned previously, PPD is estimated to occur in 13% of mothers and 10% of fathers, with the subclinical form of the disorder – postpartum distress – occurring at higher rates (Beck, 2001; Paulson & Bazemore, 2010). Though these percentages represent a significant portion of new parents, there remains a considerable portion of parents who do not experience the disorder. Thus, for those parents who do experience PPD, one would expect a decline in relationship satisfaction across the transition to parenthood. Yet, for parents who do not experience PPD there may be less of a decline, no decline, or even an increase in relationship satisfaction during the transition to parenthood. Analytic techniques such as latent class growth analysis (LCGA) allow researchers to explore inter-individual differences in intra-individual change on relationship satisfaction (Nagin, 1999; Nagin, 2005). That is, using LCGA, I can identify whether sub-groups of relationship satisfaction change exist amongst the data, and examine whether PPD predicts sub-group membership.

The current study

The current study adds to the literature in a number of ways. First, no studies presently exist examining the cross-sectional and longitudinal association of PPD on relationship satisfaction using a valid and reliable measure of PPD specifically. For the present study, I used a shortened version of the Postpartum Depression Screening Scale
(PDSS) developed by Beck and Gable (2000), which has demonstrated considerable construct validity, reliability, and sensitivity as compared to other measures of PPD (Beck & Gable, 2001). Instead of assessing general mood disturbance, the PDSS assesses mood problems associated with the child and parenting, which represents an important conceptual distinction. Items such as “I got anxious over even the littlest things that concerned my baby”, and “I felt like I was not the parent I wanted to be,” illustrate the distinction between general depression inventories administered during the postpartum period – which focus on general mood problems not related to any specific stressor or issue (e.g. general irritability) – and the PDSS, which assesses parents’ depression surrounding the baby and parenthood.

Second, prior research on the association between PPD and relationship satisfaction is largely cross-sectional, and primarily examines the influence of relationship satisfaction on PPD. Though we believe the causal link between PPD and relationship satisfaction is reciprocal (i.e. both PPD and relationship satisfaction have the potential to cause each other), no studies have established the association between prior PPD and subsequent relationship satisfaction across time. Testing the association across time is the first step in confirming the notion that PPD negatively influences new parents’ relationship satisfaction.

Third, prior research on PPD typically does not include both mothers and fathers. Of existing cross-sectional and longitudinal studies, none have taken into account the importance of both partners when examining PPD and relationship satisfaction. Based on the Actor Partner Interdependence Model (APIM), I expand on prior research by testing
for actor and partner effects simultaneously both cross-sectionally and across time, thereby accounting for the interdependence between partners.

Fourth, I expand on prior research by incorporating person-centered approaches into our study. There is good theoretical reason to believe that new parents differ in their patterns of relationship satisfaction change over the transition to parenthood; in other words, sub-groups may exist among new parents, with some experiencing a decline in relationship satisfaction, while others remain stable (Belsky & Rovine, 1990; Belsky & Hsieh, 1998). Latent class growth analysis identifies distinct sub-groups of change in relationship satisfaction across the transition to parenthood, as well as whether PPD can predict membership in the sub-groups in the current sample.

In order to understand PPD’s influence on relationship satisfaction in first-time parents, the current study seeks to test four hypotheses:

- **Hypothesis 1**: Concurrently, I predict PPD will be negatively associated with relationship satisfaction for both mothers and fathers.

- **Hypothesis 2**: Longitudinally, I expect PPD to predict a decrease in relationship satisfaction for both mothers and fathers.

- **Hypothesis 3**: Based on APIM (Cook & Kenny, 2005), I predict partner effects of PPD on relationship satisfaction. In other words, I expect maternal PPD will predict paternal relationship satisfaction and paternal PPD will predict maternal relationship satisfaction.

- **Hypothesis 4**: Using latent class growth analysis, I expect that those individuals who experience higher levels of PPD will be more likely to fall
into a sub-group with a declining trajectory on relationship satisfaction, whereas those who experience low to moderate levels of PPD will be more likely to belong to a group with a stable or increasing trajectory on relationship satisfaction.
CHAPTER II

METHODS

Participants

Participants consisted of 104 heterosexual couples who were part of the Baby T.I.M.E. (Transitions in Marital Exchanges) Study (Biehle & Mickelson, 2011). The Baby T.I.M.E. Study was conducted to examine risk and protective factors for postpartum depression among new parents. Couples were either married or cohabiting (91% were married), and on average had been married/cohabiting for about 3 years (\(M = 3.38; SD = 2.16\)). All participants were required to speak fluent English and be employed at the time of the first interview in order to be eligible for participation. Recruitment was conducted at local birthing classes and through online message boards. The average age for the sample at the first-wave of data collection was 29 years old, with fathers being slightly older on average than mothers (fathers: \(M = 29.99; SD = 4.77\) mothers: \(M = 28.06; SD = 3.80, p < .05\)). The sample was largely homogenous in terms of most demographic characteristics (see Table 1): participants were mostly White (88% of participants), college educated (75% of participants), and middle- to upper-income (72.2% of households made $60,000 or more a year).

Procedure

Couples agreed to take part in a year-long, longitudinal study in which they would be interviewed at four time points: during the third trimester of pregnancy, one-month
Table 1. Demographic characteristics of the sample.

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<td>M</td>
<td>SD</td>
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<td>4.77</td>
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<td>28.06</td>
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<td>2.10</td>
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<td>% Non-white</td>
<td>9.6%</td>
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<td>12.5%</td>
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<td><strong>Education</strong></td>
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<tr>
<td>High School</td>
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<td>$40,000 - 60,000</td>
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postpartum, four-months postpartum, and nine-months postpartum. Participants were first asked to complete an online survey (either from work or home). Within 24 hours of finishing the online survey, participants were contacted by a trained interviewer and completed the final portion of the survey via telephone. Mothers and fathers completed the survey separately, and in total the surveys took about an hour to complete at each wave. Each couple received $25 upon completion of each phase of the interview. I tested for differential attrition on our major study variables (PPD and relationship satisfaction) and on various demographic variables (e.g. age, marital status, race, etc.). None of the major study variables were significantly related to attrition; however, marital status ($X^2(1) = 32.90, p < .001$) and age ($B = .31, SE = .09, p < .001$) were both significantly associated with dropping out of the study such that younger and unmarried individuals were more likely to drop out. The current study utilized all four waves of data collection for our various analyses ($N = 104$ couples at pregnancy, 92 at one-month, 83 at four-months, and 83 at nine-months).

Materials

Sociodemographics. A number of sociodemographic characteristics potentially related to the major study variables were assessed, including age, race/ethnicity, education, and income. The current sample ranged from age 18 to 52 years old.

Education consisted of five categories: some high school, high school, some college, college, or an advanced degree. Income was a measure of the total household income at the time of the first interview, and the categories were: below $20,000, $20,001 - $40,000, $40,001 - $60,000, $60,001 - $80,000, $80,001 - $100,000, $100,001 -
$120,000, or more than $120,000. Race/ethnicity was assessed using a one-item self-report question which asked participants to identify their race from the categories of white, African-American, Hispanic, Asian, or other.

Relationship satisfaction. Relationship satisfaction was measured using the Relationship Assessment Scale (Hendrick, 1988). Participants were asked to rate their relationship on six items on a scale from 1 to 7 with varying anchor labels depending on the question (see Appendix A). A mean score for the measure was created such that a higher score indicates greater relationship satisfaction (Fathers at pregnancy: $\alpha = .72$ for men; Mothers at pregnancy: $\alpha = .61$; Fathers at 1-month: $\alpha = .72$; Mothers at 1-month: $\alpha = .61$; Fathers at 4-months: $\alpha = .82$; Mothers at 4-months: $\alpha = .81$; Fathers at 9-months: $\alpha = .84$; Mothers at 9-months: $\alpha = .82$).

Maternal and Paternal PPD. To measure PPD in both mothers and fathers, a shortened version of the Postpartum Depression Screening Scale (PDDS; Beck & Gable, 2000) was administered at all postpartum interview sessions. Participants were asked to report how they felt in the last week on 11 items assessing their postpartum mood state on a scale of 1 = strongly disagree to 5 = strongly agree (see Appendix A). A total PPD score was created for both mothers and fathers by summing the scores from the individual items. The scale demonstrated high internal consistency at all waves of data collection (Fathers at 1-month: $\alpha = .86$; Mothers at 1-month: $\alpha = .83$; Fathers at 4-

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2 The seventh item from the Relationship Assessment Scale (“to what extent has your relationship met your original expectations?”) was removed due to the longitudinal nature of the study. We asked this question at baseline, but felt its meaning would be obscured by asking it repeatedly across the study.
months: α = .81; Mothers at 4-months: α = .83; Fathers at 9-months: α = .80; Mothers at 9-months: α = .86).

Data analysis

The data were analyzed using Structural Equation Modeling (SEM) and Latent Class Growth Analysis (LCGA). First, to test for PPD’s association with relationship satisfaction from a dyadic perspective, I analyzed the data cross-sectionally with a series of structural path models using SEM. SEM has been highlighted as a useful tool for analyzing dyadic data by Kenny, Kashy, and Cook (2006), as it is able to simultaneously test and control for actor and partner effects. I tested three cross-sectional models, one for each postpartum wave of data collection. Each of these models was specified to estimate the effect of an actor’s PPD on their own relationship satisfaction and the effect of a partner’s PPD on their spouse/partner’s relationship satisfaction.3

To test my longitudinal hypotheses, I also used structural path models. I specified two models which tested both actor and partner effects across time: one estimating actor and partner effects for one-month PPD on four-month relationship satisfaction, and one estimating actor and partner effects for four-month PPD on nine-month relationship satisfaction, after controlling for prior relationship satisfaction in both models.

Finally, in order to analyze the data using a person-centered approach, I utilized latent class growth analysis. LCGA analyzes developmental trajectories using a semi-

3 Though the word “effect” implies causality, I use it only to stay in accordance with the language used by Kenny and colleagues (2006) to describe the APIM model. I acknowledge there may be alternative explanations for the cross-sectional and longitudinal associations I test, and do not imply causality.
parametric, group-based approach, which identifies sub-groups of change trajectories within the data (Nagin, 1999; Nagin, 2005). Predictor variables can subsequently be used to determine if certain factors distinguish individuals in different sub-groups (Nagin, 2005). In order to examine their potentially unique developmental processes, I conducted separate analyses for mothers and fathers. I first examined a series of unconditional growth models (without any predictors) in order to determine the number of sub-groups of change on relationship satisfaction that existed for mothers and fathers separately. Models were chosen based on statistical and conceptual considerations (i.e. I used both theory and model fit statistics). Next, an average of maternal PPD at 1- and 4-months postpartum and an average of paternal PPD at 1- and 4-months postpartum were entered as predictors into the final conditional model for both mothers and fathers. LCGA uses logistic regression to predict the categorical outcome of class membership.
CHAPTER III

RESULTS

Descriptive statistics for relationship satisfaction and PPD are presented in Table 2. With regards to PPD, both mothers and fathers demonstrated highest rates at one-month postpartum, with a slight but significant decrease across time (mothers $t (79) = 3.04, p < .01$; fathers $t (77) = 2.74, p < .01$). Consistent with prior research, mothers demonstrated significantly higher rates of PPD than fathers at all three postpartum time points. Also consistent with prior research, both mothers and fathers demonstrated a steady decline in average rates of relationship satisfaction across the transition to parenthood, with highest levels of relationship satisfaction reported at pregnancy and lowest levels occurring at nine-months postpartum. The within-groups difference between relationship satisfaction at pregnancy and at nine-months postpartum was significant for both mothers ($t (83) = 7.57, p < .001$) and fathers ($t (82) = 9.47, p < .001$). There were no significant gender differences on relationship satisfaction at any time point, however the correlation between pre-natal and subsequent relationship satisfaction was consistently stronger for fathers than for mothers (see Table 3).

Cross-sectional APIM models

To examine our cross-sectional hypotheses, I tested three nearly identical structural path models at one-, four-, and nine-months postpartum. The cross-sectional models were specified to test actor and partner effects concurrently. Preliminary regression analyses were conducted in order to determine the importance of including
Table 2. Descriptive statistics for major study variables.

<table>
<thead>
<tr>
<th></th>
<th>Relationship Satisfaction</th>
<th>PPD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mothers (M) (SD) (Range)</td>
<td>Fathers (M) (SD) (Range)</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>5.02&lt;sub&gt;a&lt;/sub&gt; 0.53 3.3 - 6.0</td>
<td>5.03&lt;sub&gt;a&lt;/sub&gt; 0.51 3.5 - 6.2</td>
</tr>
<tr>
<td>One-Month</td>
<td>4.81&lt;sub&gt;a&lt;/sub&gt; 0.73 2.4 - 6.2</td>
<td>4.80&lt;sub&gt;a&lt;/sub&gt; 0.76 2.5 - 6.2</td>
</tr>
<tr>
<td>Four-Months</td>
<td>4.74&lt;sub&gt;a&lt;/sub&gt; 0.74 2.3 - 6.0</td>
<td>4.74&lt;sub&gt;a&lt;/sub&gt; 0.70 2.8 - 5.7</td>
</tr>
<tr>
<td>Nine-Months</td>
<td>4.46&lt;sub&gt;a&lt;/sub&gt; 0.74 2.2 - 5.7</td>
<td>4.39&lt;sub&gt;a&lt;/sub&gt; 0.78 2.3 - 5.7</td>
</tr>
</tbody>
</table>

Note. Different subscripts denote that mean scores for males and females were significantly different at the p < .05 level.
Table 3. Bivariate correlations for major study variables.

<table>
<thead>
<tr>
<th></th>
<th>RS T1</th>
<th>RS T2</th>
<th>RS T3</th>
<th>RS T4</th>
<th>PPD T2</th>
<th>PPD T3</th>
<th>PPD T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS T1</td>
<td>0.03</td>
<td>0.29*</td>
<td>0.27*</td>
<td>0.35**</td>
<td>-0.23*</td>
<td>-0.26*</td>
<td>-0.18</td>
</tr>
<tr>
<td>RS T2</td>
<td>0.59***</td>
<td>0.50***</td>
<td>0.54***</td>
<td>0.56***</td>
<td>-0.15</td>
<td>-0.36**</td>
<td>-0.18</td>
</tr>
<tr>
<td>RS T3</td>
<td>0.54***</td>
<td>0.68***</td>
<td>0.58***</td>
<td>0.72***</td>
<td>-0.10</td>
<td>-0.32**</td>
<td>-0.19</td>
</tr>
<tr>
<td>RS T4</td>
<td>0.55***</td>
<td>0.65***</td>
<td>0.61***</td>
<td>0.48***</td>
<td>-0.18</td>
<td>-0.37**</td>
<td>-0.45***</td>
</tr>
<tr>
<td>PPD T2</td>
<td>-0.21†</td>
<td>-0.46***</td>
<td>-0.20</td>
<td>-0.15</td>
<td>0.15</td>
<td>0.69***</td>
<td>0.60***</td>
</tr>
<tr>
<td>PPD T3</td>
<td>-0.15</td>
<td>-0.33**</td>
<td>-0.24*</td>
<td>-0.17</td>
<td>0.67***</td>
<td>0.18</td>
<td>0.65***</td>
</tr>
<tr>
<td>PPD T4</td>
<td>-0.19</td>
<td>-0.37**</td>
<td>-0.19*</td>
<td>-0.23*</td>
<td>0.65***</td>
<td>0.56***</td>
<td>0.23*</td>
</tr>
</tbody>
</table>

Note. † p < .10 * p < .05 ** p < .01 *** p < .001. The bottom section of the table refers to the fathers’ scores, the top half of the table refers to mothers’ scores, and the diagonal scores in bold refer to fathers’ and mothers’ correlations to each other. RS = Relationship Satisfaction; PPD = Postpartum Depression. T1 = Pregnancy; T2 = one-month postpartum; T3 = four-months postpartum; T4 = nine-months postpartum.
potential demographic covariates, including age, race, sex of the baby, and marital status. With regards to relationship satisfaction, preliminary analyses revealed only marital status and race emerged as significant predictors (race was significant only at 4-months postpartum), and these variables were incorporated into the models as exogenous predictor variables with direct paths specified from the control to maternal and paternal relationship satisfaction at each wave. With regards to PPD, only race was significantly associated with maternal PPD at four-months postpartum. Thus, at four-months postpartum I specified a bidirectional path (in order to keep maternal PPD specified as an exogenous variable) between race and maternal PPD. The only difference between all three cross-sectional models is that race was included as a covariate at four-months postpartum, but was not included at one- and nine-months postpartum, as preliminary analyses demonstrated it was non-significantly related to any study variables at these waves.

In order to test the structural path models, I used EQS (EQS 9.1; Bentler, 2006). Prior to conducting SEM analyses, necessary assumptions were tested and found to be satisfactory in the current sample. Maximum likelihood estimation was used, as the assumption of multivariate normality was not violated. In order to determine model power, the N:q of each model was assessed, as outlined by Jackson (2003). N:q is considered a good estimate of model power because it takes into account model complexity, rather than simply the number of observed/measure variables in the model, and an N:q ratio between 10:1 and 5:1 provides adequate power. At one-month postpartum, N:q was 7:1, at four-months it was 5:1, and at nine-months it was 6:1.
Finally, all models were properly over-identified, with 15 known parameters to 13 unknown parameters at one and nine-months, and 21 known to 16 unknown parameters at four-months.

Results for the one-month model are presented in Figure 1. The model fit the data well, $\chi^2 (2, N = 92) = 0.75, p = .69, CFI = 1.00, RMSEA = 0.00 (CI = .00, .15)^4$, with a non-significant $\chi^2$ value, a CFI above .93, and an RMSEA below .08. The one-month model partially supported my hypotheses: paternal PPD predicted both paternal and maternal relationship satisfaction, and maternal PPD marginally predicted both maternal and paternal relationship satisfaction, at the $p = .08$ and $p = .07$ levels respectively.

Results from the four-month model are presented in Figure 2. The model fit the data well, $\chi^2 (3, N = 83) = 3.89, p = .27, CFI = .98, RMSEA = 0.06 (CI = .00, .20)$. The four-months model partially supported my hypotheses: maternal PPD predicted both maternal and paternal relationship satisfaction, but paternal PPD did not significantly predict either paternal or maternal relationship satisfaction.

Results from the nine-month model are presented in Figure 3. The model again fit the data well, $\chi^2 (2, N = 83) = 1.96, p = .38, CFI = 1.00, RMSEA = 0.00 (CI = .00, .22)$. The nine-month model partially supported my hypotheses: maternal PPD predicted both maternal and paternal relationship satisfaction, while paternal PPD predicted only paternal relationship satisfaction.

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4 For all of the concurrent structural path models, the upper boundary of the RMSEA confidence interval was above the recommended cut-off, probably because of the relatively small sample size for each of these analyses. Importantly, all other fit indices (including the RMSEA statistic itself) point to good fit in the models.
Figure 1. Cross-sectional APIM model at one-month postpartum.

One-Month Maternal PPD

One-Month Paternal PPD

One-Month Maternal Relationship Satisfaction

One-Month Paternal Relationship Satisfaction

-0.17* (0.01)

-0.24* (-0.03)

0.15 (7.86)*

-0.17+ (-0.02)

-0.34*** (-0.04)

0.42*** (0.18)

0.88

Note. Standardized parameter estimates are presented with unstandardized parameters in parentheses. Non-significant pathways are represented with dashed lines. Marital status was included as a covariate and significantly predicted both maternal and paternal relationship satisfaction only, such that cohabiting individuals were more likely to be dissatisfied with their relationship. * p = 0.10 * p < 0.05 ** p < .01 *** p < .001. $\chi^2$ (2, N = 92) = 0.75, p = .69, CFI = 1.00, RMSEA = 0.00 (CI = .00, .15).
Figure 2. Cross-sectional APIM model at four-months postpartum.

Note. Standardized parameter estimates are presented with unstandardized parameters in parentheses. Non-significant pathways are represented with dashed lines. Marital status and race were included as covariates. Marital status marginally predicted both relationship satisfaction variables such that cohabiting couples had lower relationships satisfaction. Race significantly predicted maternal relationship satisfaction and maternal PPD, but only marginally predicted maternal relationship satisfaction such that nonwhite individuals were more likely to be dissatisfied and experience maternal PPD. * $p = 0.10$ ** $p < 0.05$ *** $p < .01$ **** $p < .001$. $\chi^2$ (3, $N = 83$) = 3.89, $p = .27$, CFI = .98, RMSEA = 0.06 (CI = .00, .20).
Figure 3. Cross-sectional APIM model at nine-months postpartum.

Note. Standardized parameter estimates are presented with unstandardized parameters in parentheses. Non-significant pathways are represented with dashed lines. Marital status was included as a control and significantly, negatively predicted maternal relationship satisfaction only, such that cohabiting individuals were more likely to be dissatisfied with their relationship. *p < 0.10 **p < 0.05 ***p < .001. χ² (2, N = 83) = 1.96, p = .38, CFI = 1.00, RMSEA = 0.00 (CI = .00, .22).
Our cross-sectional findings suggest PPD is an important concurrent indicator of relationship satisfaction for both new mothers and fathers. For mothers, PPD significantly predicted their own relationship satisfaction across the three postpartum periods. For fathers, PPD significantly predicted their own relationship satisfaction both at one- and nine-months postpartum. We also found consistent evidence for a partner “effect” from mothers’ PPD to fathers’ relationship satisfaction, such that maternal PPD negatively predicted fathers’ relationship satisfaction in all three models.

*Longitudinal APIM models*

To test my hypotheses across time, I tested two structural path models: one with one-month PPD predicting four-month relationship satisfaction and one with four-month PPD predicting nine-month relationship satisfaction. The longitudinal models were also specified to test both actor and partner effects across time. Prior levels of relationship satisfaction were included in both models as controls. APIM suggests that prior levels of relationship satisfaction will also be related to subsequent PPD and relationship satisfaction in a dyadic, interdependent way. Thus, *a priori* I proposed a full APIM model, with pathways between all hypothetically interdependent variables. Empirically, however, because of sample size constraints, I used preliminary bivariate correlations to eliminate potentially non-significant pathways from the model to reduce the number of overall parameters tested. Regardless of the results of the bivariate correlations, all actor and partner effects between PPD and subsequent relationship satisfaction variables were included, as these paths represent the crucial tests of our hypotheses. In both initial longitudinal models marital status was included as a covariate, however it was not
significantly related to any of the variables in the model, and was excluded from subsequent analyses due to sample size considerations.

The N:q ratio of each model was again assessed to determine model power. For both longitudinal models, N:q was about 5:1. Both models were properly over-identified, with the first model containing 21 known parameters to 17 unknown parameters, and the second containing 21 known to 16 unknown parameters.

Results for the model testing one-month PPD on four-month relationship satisfaction are presented in Figure 4. The model fit the data well, \( \chi^2(4, N = 81) = 3.44, p = .49, CFI = 1.00, RMSEA = 0.00 (CI = .00, .16) \). This model did not support my hypotheses: neither maternal nor paternal PPD at one-month significantly predicted change in four-month maternal or paternal relationship satisfaction, though many of the control pathways were significant (e.g. prior relationship satisfaction was significantly associated with subsequent relationship satisfaction).

Results for the model testing four-month PPD on nine-month relationship satisfaction are presented in Figure 5. The model fit the data well, \( (5, N = 75) = 5.67, p = .34, CFI = 0.99, RMSEA = 0.04 (CI = .00, .17) \). This model partially supported my hypotheses: for mothers, four-month PPD negatively predicted their own nine-month relationship satisfaction. Other actor and partner effects from four-month PPD to nine-month relationship satisfaction were non-significant.

The longitudinal path models suggest PPD is only predictive of negative change in subsequent relationship satisfaction for mothers late in the postpartum period. For fathers, prior PPD did not predict subsequent relationship satisfaction.
Figure 4. Longitudinal APIM model predicting relationship satisfaction at four-months postpartum.

Note. Standardized parameter estimates are presented with unstandardized parameters in parentheses. For ease of presentation, covariates and non-significant pathways are not presented, with the exception of any pathways from PPD variables at one-month the relationship satisfaction variables at four-months. + $p = 0.10$ + $p < 0.05$ ** $p < .01$ *** $p < .001$. $\chi^2 (4, N = 81) = 3.44$, $p = .49$, $CFI = 1.00$, $RMSEA = 0.00$ ($CI = .00, .16$).
Figure 5. Longitudinal APIM model predicting relationship satisfaction at nine-months postpartum.

Note. Standardized parameter estimates are presented with unstandardized parameters in parentheses. For ease of presentation, covariates and non-significant pathways are not included, with the exception of any pathways from PPD variables at four-months to relationship satisfaction variables at nine-months. $^+ p = 0.10 \, ^* p < 0.05 \, ^{**} p < .01 \, ^{***} p < .001. \chi^2 (2, \, N = 75) = 5.67, \, p = .34, \, CFI = 0.99, \, RMSEA = 0.04 (CI = .00, .17).
Person-centered analyses

To test our hypotheses using person-centered analyses, I utilized LCGA. Unlike hierarchical linear modeling or growth curve modeling, which assume growth trajectories are continuously distributed, LCGA assumes growth trajectories in the population consist of distinct sub-groups (Nagin, 1999; Nagin, 2006). Thus, the goal of LCGA is to identify sub-groups, and also examine the utility of other variables (PPD) in predicting sub-group membership. It is important to acknowledge that the population probably does not fall into perfectly distinct groups, so sub-groups identified by LCGA should be considered “the best approximation of generally distinct experiences” (Lavner & Bradbury, 2010, pg 1176). LCGA uses posterior probabilities (a Bayesian criteria used evaluate conditional probability of class membership) to assign individuals to a sub-group, so individuals in each group are more similar to each other than they are to others outside the group. While each individual’s growth trajectory may not exactly match the trajectory of the group to which they are assigned, they will follow the same general pattern of change as their group (Nagin, 2005).

To determine the number of sub-groups among both mothers and fathers, I tested a number of unconditional models (i.e. models without predictor variables), using both BIC and the VLMR likelihood ratio test (VLMRLRT). BIC provides a statistical criterion to evaluate the fit of the unconditional models, with lower numbers indicating better model fit. I examined models with increasing numbers of sub-groups until BIC stopped decreasing (and starts to increase; Nagin, 2005; Helgeson, Synder & Setlman, 2004; Lavner & Bradbury, 2010). The VLMRLRT provides a hypothesis test of the
utility of the model versus a model with one fewer sub-group (Duncan, Duncan, & Strycker, 2006). If significant, the VLMRLRT indicates that the model tested is preferable to a model with one fewer sub-group. In accordance with others (e.g. Lavner & Bradbury, 2010), to avoid over-fitting the data, I set a limit on the minimum size of any sub-group at no less than 6% of the sample. As done in prior research, for each model I also examined whether the trajectories were best characterized as linear or quadratic (e.g. Helgeson, et al., 2004). To do so, I examined the significance of the quadratic coefficient; if the coefficient was non-significant I dropped the quadratic component from the model. Linear components were retained regardless of their significance.

Once I chose an unconditional model, I entered two predictor variables into the model: an average of maternal PPD at one- and four-months postpartum and an average of paternal PPD at one- and four-months postpartum. Prior research and our descriptive data (see Table 2) suggest PPD fluctuates considerably over the transition to parenthood (Paulson & Bazemore, 2010). Because I was not interested in whether PPD at any specific postpartum time-point (e.g. one- or four-months postpartum) predicted sub-group membership, I chose to average levels of PPD at one- and four-months postpartum, and thus explore whether or not generally high levels of PPD predicted sub-group membership on relationship satisfaction change. In accordance with the structural path models, I also controlled for race and marital status in the final conditional models.

5 PPD at nine-months postpartum was not used to predict class membership in change trajectory sub-groups, as the nine-month data was the last wave of data available, and use of this data would have amounted to predicting membership in change trajectory backwards.
**Mothers’ Latent Class Growth Analyses**

I first estimated a one-class model to identify the average trajectory for all mothers. Results of the one-class model were consistent with prior research, as the average growth trajectory on relationship satisfaction for all mothers started high during pregnancy, but decreased moderately across the first 9-months of the transition to parenthood \((intercept = 5.03, slope = -0.18, p < .001)\). Next, I examined a series of unconditional models with varying numbers of sub-groups. Table 4 presents model fit indices for mothers. BIC decreased from the 1-class to the 2-class model, and from the 2-class to 3-class model. However, in comparison to the 2-class model, the 3-class model failed the VLMRLRT test. Thus, I selected a 2-class model in which one class started high on relationship satisfaction at pregnancy and remained stable, and another class started moderately on relationship satisfaction at pregnancy and sharply declined across the transition to parenthood (see Table 5 and Figure 6).\(^6\) A quadratic component was significant in the declining sub-group only, suggesting this group declines particularly sharply early in the postpartum period, with a gradual shift towards more moderate declines as times passes.

Next, I examined whether maternal and paternal PPD at one- and four-months postpartum predicted mothers’ sub-group membership in the model.\(^7\) I expected that higher levels of PPD would predict membership in a declining trajectory of relationship satisfaction. Results of the logistic regression analysis supported our hypotheses, as

\(^6\) Though the high and stable class did decrease on relationship satisfaction, the decrease only amounted to less than half of a point in relationship satisfaction. On the other hand, the moderate and declining class decreased by 1.14 points on relationship satisfaction.

\(^7\) Both race and marital status significantly predicted subgroup membership in the mothers’ conditional model such that non-white and cohabiting mothers were more likely to belong to the declining sub-group.
Table 4. Model fit indices for unconditional latent class growth analyses.

<table>
<thead>
<tr>
<th></th>
<th>Mothers</th>
<th></th>
<th>Fathers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model</td>
<td>1-class</td>
<td>2-class</td>
<td>3-class</td>
</tr>
<tr>
<td>BIC</td>
<td></td>
<td>770.85</td>
<td>687.48</td>
<td>680.51</td>
</tr>
<tr>
<td>VLMRLRT</td>
<td>–</td>
<td>97.28</td>
<td>20.87</td>
<td>–</td>
</tr>
<tr>
<td>p value</td>
<td>–</td>
<td>0.001</td>
<td>0.47</td>
<td>–</td>
</tr>
</tbody>
</table>

Note. Dashes indicate VLMRLRT not estimated in a 1-class solution. BIC = Bayesian information criterion, VLMRLRT = Vuong-Lo-Mendell-Rubin Likelihood Ratio test.
Table 5. Growth factor means and standard errors for each relationship satisfaction trajectory sub-group.

<table>
<thead>
<tr>
<th>Relationship Satisfaction Trajectory</th>
<th>Intercept</th>
<th>Slope</th>
<th>Quadratic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
<td>M</td>
</tr>
<tr>
<td>High and Stable</td>
<td>5.33</td>
<td>0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>High and Declining</td>
<td>4.86</td>
<td>0.06</td>
<td>-0.08***</td>
</tr>
<tr>
<td>Moderate and Declining</td>
<td>4.11</td>
<td>0.10</td>
<td>-0.09***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relationship Satisfaction Trajectory</th>
<th>Intercept</th>
<th>Slope</th>
<th>Quadratic</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
<td>M</td>
</tr>
<tr>
<td>High and Stable</td>
<td>5.18</td>
<td>0.04</td>
<td>-0.04***</td>
</tr>
<tr>
<td>Moderate and Sharply Declining</td>
<td>4.52</td>
<td>0.14</td>
<td>-0.21***</td>
</tr>
</tbody>
</table>

Note. + p = 0.10 * p < 0.05 ** p < .01 *** p < .001. These results are from the final unconditional models. Intercepts were significant for all trajectories at the p < .001 level.
Figure 6. Mothers’ growth trajectories on relationship satisfaction from pregnancy to nine-months postpartum.

Note. One the x-axis 0 = pregnancy, 3 = one-month postpartum, 6 = four-months postpartum, and 11 = nine-months postpartum. Both maternal (estimate = -.09, \( p < .05, OR = .91 \)) and paternal PPD (estimate = -.12, \( p < .05, OR = .89 \)) at one- and four-months predicted class membership, such mothers’ higher levels of PPD, and mothers with partners who had higher levels of PPD, were less likely to fall into the high and stable class as opposed to the moderate and sharply declining class.
mothers with greater average levels of PPD were more likely to belong to the sub-group with a declining relationship satisfaction trajectory, and less likely to belong to the sub-group with a stable trajectory, \( estimate = -0.09, p < 0.05, OR = 0.91 \). Furthermore, paternal PPD predicted mothers’ sub-group membership, such that mothers’ who had partners with greater average levels of PPD were more likely to belong to the sub-group with a declining relationship satisfaction trajectory, \( estimate = -0.12, p < 0.05, OR = 0.89 \).

**Fathers’ Latent Class Growth Analyses**

For fathers, I first estimated a one-class model. Results of the 1-class model were consistent with prior research, as the average growth trajectory on relationship satisfaction for all fathers started high, but moderately declined across the transition to parenthood \( (intercept = 5.04, slope = -0.20, p < .001) \). Next, I examined a series of unconditional models (see Table 4) in terms of BIC, the VLMRLRT, and conceptual criteria. For fathers, BIC decreased from the 1-class to the 2-class model, and from the 2-class to 3-class model, however from the 3-class to the 4-class model BIC increased. Furthermore, the VLMRLRT test for the 4-class model was significant, and one of the sub-groups in the 4-class model contained only 4.8% of the sample, below the minimum cutoff of 6%. Thus, I selected a 3-class model in which one group started high on relationship satisfaction at pregnancy and remained relatively stable, one group started high on relationship satisfaction at pregnancy and declined, and one class started moderately on relationship satisfaction and declined across the transition to parenthood.
A quadratic component was retained for the high and stable sub-group only, suggesting this sub-group experiences virtually no change in relationship satisfaction early in the postpartum period, but may begin to experience slight declines later.

Next, I examined whether paternal and maternal PPD at one- and four-months postpartum predicted fathers’ sub-group membership in the 3-class model. I expected that higher levels of both paternal and maternal PPD would predict membership in a sub-group with a declining relationship satisfaction trajectory. Results of the logistic regression analysis supported my hypotheses, as fathers with greater average levels of PPD were more likely to belong to the moderate and declining relationship satisfaction trajectory, as compared to the high and stable trajectory, estimate = -.19, p < .05, OR = .83. Additionally, fathers whose partner reported greater average levels of PPD were more likely to belong to the moderate and sharply declining trajectory as compared to the high and stable trajectory, estimate = -.11, p < .05, OR = .91. In summary, our person-centered analyses indicate both maternal and paternal PPD predict membership in a sub-group with a declining relationship satisfaction trajectory for both mothers and fathers.

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8 Though the high and stable sub-group did decrease in relationship satisfaction, the decrease only amounted to less than half of a point on the relationship assessment scale. On the other hand, the moderate and slightly declining sub-groups decreased by 0.85 points and the moderate and declining class decreased by 1.01 points on relationship satisfaction.

9 Marital status significantly predicted sub-group membership in the conditional model for fathers such that cohabiting fathers were more likely to belong to the moderate and sharply declining sub-group.
Figure 7. Fathers’ growth trajectories on relationship satisfaction from pregnancy to nine-months postpartum.

Note. One the x-axis 0 = pregnancy, 3 = one-month postpartum, 6 = four-months postpartum, and 11 = nine-months postpartum. Both paternal (estimate = -.19, \( p < .05, OR = .83 \)) and maternal (estimate = -.11, \( p < .05, OR = .91 \)) PPD predicted sub-group membership, such that fathers with higher levels, and fathers whose partners had higher levels of PPD, were less likely to fall into the high and stable sub-group as compared to the moderate and declining sub-group.
CHAPTER IV

DISCUSSION

While prior research and theory has converged in suggesting PPD may be an indicator of relationship satisfaction, no previous studies have systematically examined this link. The current study filled the gap in the literature by examining PPD as a negative predictor of relationship satisfaction during the transition to parenthood using dyadic, longitudinal, and person-centered methods. Concurrently, I found both mothers’ and fathers’ PPD negatively predicted their own relationship satisfaction, and mothers’ PPD negatively predicted fathers’ relationship satisfaction. Our longitudinal results were mixed: while the APIM analyses found a significant actor effect for mothers only, our latent class growth analyses found higher levels of PPD reported by both the actor and the partner were associated with membership in a sub-group which declined on relationship satisfaction for both mothers and fathers. The implications and future directions of our study are discussed below.

*APIM models of PPD and relationship satisfaction*

While many previous studies examined the concurrent association between relationship satisfaction and PPD, prior research too often focused on one parent alone, without examining the crucial component of their partner’s PPD and relationship satisfaction. Based on the Actor Partner Interdependence Model (Cook & Kenny, 2005), our concurrent analyses expanded on prior research by examining the association between mothers’ and fathers’ PPD and relationship satisfaction in a dyadic way. With
regards to “actor effects”, I found a robust association between one’s own PPD and relationship satisfaction for both mothers and fathers across multiple postpartum time points.\textsuperscript{10} I also found support for a “partner effect” from mothers’ PPD to fathers’ relationship satisfaction at all three postpartum waves of data collection. This finding suggests that, in the short-term, mothers’ PPD may have implications not only for her own relationship satisfaction, but also for her partner’s relationship satisfaction. I believe this finding is due to mothers often being primarily responsible for parenting. Though fathers are becoming more involved in parenting than in the past, mothers tend to occupy the “parental driver’s seat” such that they are the primary caregiver for the child, while fathers are more secondary (Allen & Hawkins, 1999; McBride et al., 2005). As such, mothers’ experiences with parenting may be particularly important to how the couple adjusts as a whole. Thus, (using the language of Dew and Wilcox (2011)), “if momma ain’t happy” it probably spills over and affects “daddy” too. It is important to note that our concurrent results cannot speak definitively to the directionality of these findings. Indeed, it is equally likely that negative feelings about the spousal relationship influence concurrent feelings of PPD, and these variables may be intertwined in a reciprocal, cyclical nature. Though beyond the scope of the current study, future research should examine the potential reciprocal relationship between PPD and relationship satisfaction.

I also conducted a rigorous longitudinal and dyadic examination of PPD as a predictor of change in relationship satisfaction during the transition to parenthood.

\textsuperscript{10} The exception was at four-months postpartum, fathers’ PPD was not significantly associated with their own relationship satisfaction, and at one-month postpartum, mothers’ PPD was marginally associated with their own relationship satisfaction in the hypothesized direction.
Across time, only mothers’ PPD predicted subsequent relationship satisfaction. This finding may be due to the salience of the parenting role for mothers; prior research suggests the parenting role is particularly important for mothers’ identity (e.g. Maurer, Pleck & Rane, 2001). For example, Umberson, Chen, House, Hopkins, and Slaten (1990) found the parental role had more of an impact on well-being for mothers than for fathers. Thus, if a mother experiences PPD – which is depression specific to the baby and parenting – it likely spills over into many aspects of the mother’s life, including her reports of the spousal relationship. It is also possible I did not find a longitudinal result for fathers simply because pre-natal levels of relationship satisfaction (the control variable) were so highly associated with subsequent relationship satisfaction. For fathers, pre-natal relationship satisfaction was strongly associated with subsequent relationship satisfaction at four- \( (r = .54) \) and nine-months \( (r = .55) \) postpartum, whereas for mothers the correlation was only moderate from pre-natal relationship satisfaction to four- \( (r = .27) \) and nine-months postpartum \( (r = .35) \). As such, after partialling out the variance associated with prior relationship satisfaction there was little variance to predict fathers’ subsequent relationship satisfaction. Our person-centered analyses help address this problem by a) examining sub-groups of parents rather than examining the sample as a whole and b) examining the entire trajectory of relationship satisfaction across all four time points rather than change between two time points (e.g. pre-natal and nine-months postpartum).
Person-centered analyses

As opposed to the APIM approach, our person-centered analyses ask a fundamentally different question. Specifically, for those parents who do experience negative change in relationship satisfaction across the transition to parenthood, is PPD a factor? Because these analyses look at sub-groups within our data, as well as all four waves of data collection, they potentially address the methodological issue among fathers where, between two time points, pre-natal relationship satisfaction was highly associated with subsequent relationship satisfaction. I expected there would be small but meaningful sub-groups of both mothers and fathers who demonstrated significant change on relationship satisfaction, and that PPD would predict sub-group membership. The person-centered analyses were in line with my hypotheses. I identified distinct sub-groups for change on relationship satisfaction and found the majority of both mothers (79%) and fathers (52%) remained relatively stable across the transition to parenthood. Moreover, for mothers, higher levels of both maternal PPD and paternal PPD predicted membership in the sub-group with a declining relationship satisfaction trajectory. Similarly, higher levels of both maternal and paternal PPD predicted membership in the small sub-group of fathers who experienced the greatest deterioration in relationship satisfaction. Thus, in line with APIM, when examining relationship satisfaction change across all four time points and from a person-centered perspective, it appears both an individual’s own and their partner’s PPD are important factors in predicting whether or not they belong to a declining relationship satisfaction sub-group or a stable one. Furthermore, our person-centered analyses attest to the importance of considering the
great heterogeneity among parents making the transition to parenthood (Belsky & Rovine, 1990). All parents are different; they do not all experience PPD, and neither do they all experience the transition to parenthood as detrimental to their relationship. Future research should continue to look beyond theoretical and analytic approaches which rely on sample-wide aggregation to further identify sub-groups of parents for which the transition to parenthood may be different.

*What are the mechanisms?*

While the current study makes significant strides in establishing PPD as a negative predictor of relationship satisfaction, it does not speak to the potential mechanisms by which PPD may predict less relationship satisfaction. As suggested in the Introduction, PPD may relate to relationship satisfaction through stress generation (i.e., people with PPD may simply act more negatively and thus create more stress in their relationships) or through partner burden (i.e., PPD creates burdens for the partner of the depressed person which negatively affects the relationship). PPD might also affect the co-parenting relationship. Prior research has shown that co-parenting, or the extent to which parents work together in a collaborative parenting partnership, is a key aspect of familial adjustment (Margolin, Gordis & John, 2001). Parents engaged in a collaborative co-parenting partnership foster an environment of support and positive interaction, which is likely positive for relationship satisfaction. PPD may disrupt healthy collaboration between co-parents by causing withdrawal from parenting tasks or increases in negative behavior. In this way, disruptions in the collaborations between parents may harm the spousal relationship. Clearly, there are many mechanisms by which PPD might
negatively influence relationship satisfaction. While beyond the scope of this study, future research should explore these potential mechanisms (e.g., co-parenting, stress generation, etc.) to help explicate the nature of the relationship between PPD and relationship satisfaction.

Limitations

The current study should be considered in light of its limitations. First, our sample was largely homogenous in terms of demographic characteristics, meaning our results require replication in samples with more socioeconomic and ethnic diversity, as PPD and relationship satisfaction may operate differently among samples of different demographic backgrounds. Another limitation of our study is sample size. Given the nature of our longitudinal APIM analyses, it is possible some of the non-significant findings may become significant in larger samples. For example, the actor effect from fathers’ four-month PPD to nine-month relationship satisfaction was trending towards significance in the hypothesized direction, but I lacked a large enough sample to significantly detect this small association (especially given the high association between pre-natal and nine-month relationship satisfaction among fathers). Finally, a note about causality is warranted. Our results do not imply causality, as bi-directionality is possible in our concurrent and person-centered analyses. While our longitudinal APIM models make strides in establishing temporal precedence, there may still be alternative explanations for the longitudinal associations I modeled.
Conclusion

The current study makes a significant contribution to the literature by providing evidence for PPD as a negative predictor of relationship satisfaction during the transition to parenthood. Given the importance of the spousal relationship during this period of significant change, our results provide renewed focus on the dyadic intertwining of postpartum mental health and relationship satisfaction. Future research should continue to examine this issue, which may be crucial for new parents’ healthy and happy adjustment.
REFERENCES


APPENDIX A

BABY T.I.M.E. MEASURES
**RELATIONSHIP SATISFACTION**

1a. How well has your partner met your needs?

| Not at all | 1 | 2 | 3 | 4 | 5 | 6 | Very Well | 7 |

1b. How satisfied have you been with your relationship?

| Completely Dissatisfied | 1 | 2 | 3 | 4 | 5 | 6 | Completely Satisfied | 7 |

1c. How good do you feel your relationship is compared to most couples?

| Much Worse | 1 | 2 | 3 | 4 | 5 | 6 | Much Better | 7 |

1d. How often have you wished you hadn't gotten into this relationship?

| Never | 1 | 2 | 3 | 4 | 5 | 6 | Very Often | 7 |

1e. How many problems have there been in your relationship?

| None | 1 | 2 | 3 | 4 | 5 | 6 | A lot | 7 |

1f. How much do you love your partner compared to other couples?

| None | 1 | 2 | 3 | 4 | 5 | 6 | A lot | 7 |

1g. To what extent has your relationship met your expectations?

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | Completely | 7 |
POSTPARTUM DEPRESSION

Below is a list of statements describing how a parent may feel after the birth of their baby. Please indicate how much you agree or disagree with each statement thinking about how you have felt in the PAST 7 DAYS.

1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

1. I had trouble sleeping even when my baby was asleep.
2. I got anxious over even the littlest things that concerned my baby.
3. I felt like my emotions were on a roller coaster.
4. I felt like I was losing my mind.
5. I was afraid that I would never be my normal self again.
6. I felt like I was not the parent I wanted to be.
7. I felt like so many other parents were better than me.
8. I felt all alone.
9. I find myself eating even when I am not hungry.
10. I felt full of anger and ready to explode.
11. I did not feel real.