

Adolescent Motherhood: Understanding the Link Between Maternal Depression, Parenting, and
Child Maltreatment

A Dissertation Submitted by

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in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

in

Child Study and Human Development

Eliot-Pearson Department of Child Study and Human Development

Tufts University

May 2015

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Abstract

The present study examined the longitudinal trajectories of maternal depression among 508 young mothers who participated in an evaluation of a state-wide home visiting program for first-time mothers under age 21 across the first two years of parenting to answer the following questions: 1) does the rate of child maltreatment vary across different depression trajectory profiles?; 2) does early parenting predict the rate of child maltreatment, with different associations across multiple depression trajectories?; and 3) do three selected protective factors: (a) mother's cognitive ability to mentalize her child's mental states, (b) the quality of the relationship with the father of the baby, and (c) her participation in a home visitation program, promote positive early parenting, with different effects across different depression trajectories?

Five viable maternal depression trajectories were found using Growth Mixture Modeling, and multiple group path analyses revealed that although the number of child maltreatment reports was similar across depression trajectories, early positive parenting was related to fewer number of child maltreatment reports filed after children were about a year old for chronically depressed mothers. Longer duration, frequent receipt of home visits, and younger child age were associated with less optimal parenting. Previous child maltreatment reports filed also were significantly associated with parenting and child maltreatment reports filed after children were about a year old. The findings suggest heterogeneity in the experience of maternal depression among young mothers, and early promotion of positive parenting may be the key to preventing child maltreatment among the most vulnerable group of young mothers. The implications for research, policy, and practice are discussed.

ACKNOWLEDGEMENTS

As I complete this chapter of my academic adventure, I feel truly lucky to have a team of supportive and inspiring people who have made this dissertation possible.

First and foremost, I would like to offer my sincerest gratitude to my incredible committee members. I would like to express the deepest appreciation to my mentor, advisor, and committee chair, Dr. Ann Easterbrooks. Ann has guided me throughout my time at Tufts with her patience, encouragement, and knowledge, and she has been a central figure in my academic development. I admire her devotion for moving the field forward in promoting family and child well-being, and I am forever grateful and humbled by her dedication in her mentorship. I am heartily thankful to Dr. Francine Jacobs, whose insights on program and policy have truly been valuable to developing this dissertation as well as for my own knowledge on program evaluation. I would also like to sincerely thank Dr. Xiaodong Liu for his advice and crucial contribution that triggered and nourished my statistical maturity that I will benefit from, for a long time to come. Finally, I would like to thank Dr. Catherine Ayoub, for her generosity to share her knowledge and provide feedback on the final product of this dissertation. Without their guidance, encouragement, and insights, this dissertation would not have been possible.

I also would like to express my sincere gratitude to my policy mentor, Suzin Bartley, whose expertise in policy and child maltreatment prevention has provided invaluable insights to this dissertation. I truly respect her dedication in her work at the Children's Trust and admire her strength as a person and as a professional. I truly enjoyed our monthly meetings, filled with stimulating discussions of child maltreatment and family policy.

I could not have completed this dissertation and pulled through during some tough times without the support from the incredible members of Tuft Interdisciplinary Evaluation Research.

Their intellectual expertise and collaboration have constantly nourished my passion in child development, and their friendship and companionship has kept me sane and reminded me to laugh. For that, I'm forever indebted.

I also would like to thank the faculty, peers, staff, and community at the Eliot-Pearson for their continuous encouragement and guidance at many levels. I also could not have completed this dissertation without the support from the Doris Duke Charitable Foundation at Chapin Hall who has offered me the opportunity to be a part of the Doris Duke Fellowship for the Promotion of Child Well-Being. Many thanks to Dr. Deborah Daro, Lee Ann Huang, and the fellows in my cohort for the guidance and inspiration, not only for this dissertation, but for nourishing my passion of child maltreatment prevention.

My family also deserves recognition. To my father, Hisataka Kotake, you have unconditionally encouraged me throughout my journey of pursuing my dream, whether it was a dream of being a flight attendant or a dream of pursuing a doctorate. You have instilled in me a passion and a "never give up" attitude towards the things I did, and you have always been there to keep my chin up high when I am down. To my father-in-law, Phillip Ong, you have always been a support for me from the get go, and provided me with valuable insights to the real life in a foreign country. My brother, Tatsuya, your unconditional support has always kept me going, and I always knew that you were on my side, for laughter and tears. To Gabie and Grace, I was so happy to have another brother and a sister in my life, and I want to thank you for brightening my life with your support and love for the family.

To my husband, Chris. Where do I begin? I have been in school for most of our years together, and although I have kept you up late at times proof reading mountains of papers, you

have showered me with nothing but encouragement, patience, and guidance. With a little baby girl coming on our way, I am forever grateful for your unconditional love.

Finally, to my mother, Akiko Kotake. You managed to always keep me moving forward with your words and wisdom. Your smile has always been a sunshine in my heart that always kept me smiling and to never lose sight of myself. Dulce Ong, my mother-in-law, you became a second mother to me the moment I met you, and you have showered me with unconditional support throughout my years in the United States. It saddens me that both of you are not here to see me complete my dissertation, but I know you are proud of me.

*I dedicate this project to my mother, Akiko Kotake, and my mother-in-law, Dulce Q. Ong,
who taught me the true meaning of strength, hope, and life.*

Table of Contents

Abstract	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	ix
LIST OF FIGURES	xi
CHAPTER ONE: PROBLEM STATEMENT	1
Introduction	1
Statement of the Problem	2
Prevalence of depression and child maltreatment	2
Depression, mothers, and children	4
Adolescent parenthood and depression	6
Complexity of the relation between maternal depression and child maltreatment	7
Study Aims	10
Theoretical Framework: Maternal Depression, Adolescent Parenthood, and Child Maltreatment	10
Conceptual Framework of the Study.....	13
CHAPTER TWO: LITERATURE REVIEW	17
Maternal Depression as a Predictor of Child Maltreatment.....	17
Risk of child maltreatment among depressed adolescent mothers	21
Beyond the Effects of Maternal Depression	24
Chronicity and severity of maternal depression and child maltreatment.....	27
Early parenting as a precursor to child maltreatment	32
Protective factors in the presence of maternal depression	38
Methodological Considerations.....	61
Overall Summary of the Literature	65
Research Questions of Dissertation.....	66
CHAPTER THREE: METHOD	77
Study Design	77
Sample.....	78
Procedure.....	78
Measures and Constructs.....	79
Family demographics for descriptive purpose.	79

Covariates.	80
Model variables.	80
Analytic Strategy.....	87
Measurement model and invariance.	90
Structural model and concepts.	92
Missing data.	94
CHAPTER FOUR: RESULTS	95
Characteristics of the Full Study Sample	95
Research Question 1: What Are the Trajectories of Depression Among Young Mothers Across Their Children’s First Three Years of Life?.....	98
Examination of Measurement Model.....	101
Research Question 2: What Are the Relations Between the Trajectories of Maternal Depression and Child Maltreatment?.....	104
Research Question 3: Does Early Parenting Predict Child Maltreatment, with Different Associations Across Different Depression Trajectories?.....	104
Research Question 4: Are Selected Protective Factors (Maternal Mentalization, Father Relationship, Home Visitation Program Utilization) Related to Parenting, with Different Associations Across Different Depression Trajectories?.....	109
CHAPTER FIVE: DISCUSSION.....	120
Variability in the Experience of Maternal Depression.....	121
Beyond the Effects of Maternal Depression	123
Early Parenting as a Precursor to Child Maltreatment.....	124
Early Intervention as Critical Act for Child Maltreatment Prevention	129
Reconsidering the Role of Protective Factors	132
Maternal mentalization.	132
Mother-father relationship.	134
Home visitation.....	136
Study Limitations	138
Implications for Research, Policy and Practice.....	143
Conclusion.....	149
References	151
Tables	200

LIST OF TABLES

Table 1. Full Sample Descriptives	200
Table 2. Statistical Details of the Criteria Used to Determine the Most Viable Groups of Depression Trajectories	203
Table 3. Depression Trajectory Groups Descriptives	204
Table 4. Factor Loadings, Intercepts, Residual Variances, and Latent Mean, Variances and Covariances of the Modified Configural, Weak, and Strong Measurement Model	207
Table 5. Model Fit Statistics for the Test of Invariance in Parenting and Mother-Father Relationship Across Depression Trajectory Groups.....	211
Table 6. Model Fit Statistics of the Nested Model Comparisons Examining Mean Number of Child Maltreatment Reports Across Depression Trajectory Groups	212
Table 7. Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Parenting, and Number of Child Maltreatment Reports Across Depression Trajectory Groups.....	213
Table 8. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Parenting, and Number of Child Maltreatment Reports Across Depression Trajectory Groups	215
Table 9. Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Maternal Mentalization, and Parenting Across Depression Trajectory Groups	218
Table 10. Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Mother-Father Relationship, and Parenting Across Depression Trajectory Groups.....	220
Table 11. Model Fit Statistics of the Nested Model Comparisons Examining the Relations Between Covariates, Program Intensity, and Parenting Across Depression Trajectory Groups.....	222
Table 12. Model Fit Statistics of the Nested Model Comparisons Examining the Relations Between Covariates, Number of Groups, and Parenting Across Depression Trajectory Groups.....	223
Table 13. Model Fit Statistics of the Nested Model Comparisons Examining the Relations Between Covariates, Number of Visits, and Parenting Across Depression Trajectory Groups.....	224
Table 14. Model Fit Statistics of the Nested Model Comparisons Examining the Relations Between Covariates, Duration, and Parenting Across Depression Trajectory Groups.....	226

Table 15. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Maternal Mentalization, and Parenting Across Depression Trajectory Groups	227
Table 16. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Mother-Father Relationship, and Parenting Across Depression Trajectory Groups	230
Table 17. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Program Intensity, and Parenting Across Depression Trajectory Groups	233
Table 18. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Number of Groups, and Parenting Across Depression Trajectory Groups	236
Table 19. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Number of Visits, and Parenting Across Depression Trajectory Groups	239
Table 20. Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Duration, and Parenting Across Depression Trajectory Groups	242

LIST OF FIGURES

Figure 1. Proposed conceptual framework for maternal depression, adolescent parenthood, and child maltreatment	14
Figure 2. Model that represents the maternal depression trajectories (Research question #1).....	67
Figure 3. Proposed structural model that represents the relations between maternal depression trajectories and child maltreatment (Research question #2).....	68
Figure 4. Proposed structural model that represents the relations between parenting and number of child maltreatment reports, moderated by depression trajectory groups, with covariates (Research question #3).....	70
Figure 5. Proposed structural model that represents the relations between maternal mentalization and parenting, moderated by depression trajectory groups, with covariates (Research question #4).....	72
Figure 6. Proposed structural model that represents the relations between mother-father relationship and parenting, moderated by depression trajectory groups, with covariates (Research question #4).....	73
Figure 7. Proposed structural model that represents the relations between program utilization indicators and parenting, moderated by depression trajectory groups, with covariates (Research question #4).....	75
Figure 8. Proposed measurement model that represents the relations between mother-father relationship and parenting.....	89
Figure 9. Five patterns of maternal depression trajectories across three time points, with a cut-off score at 16.....	99
Figure 10. Modified measurement model that represents the relations between mother-father relationship and parenting.....	103
Figure 11. Final structural model that represents the relations between parenting and number of child maltreatment reports across depression trajectory groups, with covariates (Research question #3).....	107
Figure 12. Final structural model that represents the relations between maternal mentalization and parenting across depression trajectory groups, with covariates (Research question #4).....	111

Figure 13. Final structural model that represents the relations between mother-father relationship and parenting across depression trajectory groups, with covariates (Research question #4).....	114
Figure 14. Final structural model that represents the relations between program utilization indicators and parenting across depression trajectory groups, with covariates (Research question #4).....	118

CHAPTER ONE: PROBLEM STATEMENT

Introduction

Maternal depression is a serious mental health condition that interferes with the lives of millions of mothers and young children in the United States (National Research Council and Institute of Medicine (NRC & IOM), 2009). It diminishes a mother's confidence as a parent and prevents her from providing the adequate care and nurturance for her child (Hoffman, Crnic & Baker, 2006; NRC & IOM, 2009; Silver, Heneghan, Bauman & Stein, 2006). Furthermore, maternal depression is often identified as a risk factor for child maltreatment, putting a child at risk for serious physical, cognitive, social, and emotional difficulties (NRC & IOM, 2009).

Adolescent mothers, unfortunately, face the risks of depression and child maltreatment at a higher rate than do adult mothers (Lee & Goerge, 1999; Whitman, Borkowski, Keogh, & Weed, 2001)¹. These higher rates of complications may result, in part, from multi-layered challenges related to adolescent parenthood (e.g., limited cognitive maturity, family conflict, and limited social and financial resources) (Meade, Ickovics, & Kershaw, 2008; Moore & Brooks-Gunn, 2002; Oberlander, Black & Starr, 2007). However, many adolescent mothers do show parenting competence despite their challenges such as depression (Easterbrooks, Chaudhuri, Bartlett & Copeman, 2010). Embedded in a large-scale randomized controlled trial evaluation of a state-wide home visiting-based child maltreatment prevention program, this dissertation investigated longitudinal trajectories of maternal depression among young mothers in order to understand the nature of associations between maternal depression, parenting, and child maltreatment, and to explore the role of mothers' cognitive maturity, quality of mother-father relationship, and program use.

¹ Adolescent mothers is used synonymously with teen mothers and young mothers.

Statement of the Problem

Prevalence of depression and child maltreatment. Depression is a leading mental health problem experienced by 16.2% of adults across all races and social classes in the United States (NRC & IOM, 2009). It is defined as a mood disorder in which an individual feels hopeless, frustrated, fatigued, and experiences loss of interest or pleasure in life activities (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR); American Psychological Association (APA), 2000). These symptoms impair an individual's personal, social, and other critical areas of daily functioning (DSM-IV-TR; APA, 2000). Depression may be chronic or intermittent and the experiences of depressive symptoms can differ significantly across individuals (Beardslee, 2002; Brodowski, 2012; Center on the Developing Child at Harvard University, 2009). While several diagnostic tools have been developed and utilized to identify depression, many cases of depression go unidentified and untreated (O'Hara, 1997; Tandon, Parillo, Jenkins & Duggan, 2005). Even when identified, treatments are often inadequate, leading to various adverse outcomes including health complications, unemployment, and marital conflicts (O'Hara, 1997; Kessler et al., 2003).

Many individuals who suffer from depression are parents of one or more children under the age of 18. About 15.6 million children under the age of 18 are living with an adult who has experienced major depression (NRC & IOM, 2009). In particular, depression is common among mothers of young children, where approximately 12 to 18% of them are estimated to suffer from depressive symptoms (Horwitz, Briggs-Gowan, Storfer-Isser & Carter, 2007; Knitzer, Theberge, & Johnson, 2008). Although depression is experienced by mothers across races and social classes, the prevalence of maternal depression increases in families who have limited economic resources (Beeghly, Weinberg, Olson, Kennan, Riley & Tronick, 2002; Eamon & Zuehl, 2001;

NRC & IOM, 2009)². At least 25% of mothers in the low-income population were found to be clinically depressed (Knitzer et al., 2008). Moreover, depression is often recurrent, and the likelihood of experiencing subsequent episodes increases with each additional episode of maternal depression (Burcusa & Iacono, 2007; NRC & IOM, 2009).

Child maltreatment also is a grim reality worldwide, including U.S. society. Child maltreatment is defined as “any recent act or failure to act on the part of a parent or caregiver, which results in death, serious physical or emotional harm, sexual abuse or exploitation, or an act or failure to act which presents an imminent risk of serious harm” (U.S. Department of Health and Human Services Administration for Children and Families (US DHHS), 2015, p. 17). In 2013, the Children’s Bureau reported that approximately 3.9 million children were the subjects of suspected reports of child maltreatment, and 679,000 of these children were victims of substantiated or indicated child maltreatment (US DHHS, 2015). Neglect was the most common type of maltreatment (79.5%). Children also suffered from physical abuse (18%), sexual abuse (9%), psychological maltreatment (8.7%), medical neglect (2.3%), and other forms of maltreatment (10%; e.g., lack of supervision, parental substance abuse) (US DHHS, 2015). The majority of the maltreatment (88.6%) was perpetrated by at least one parent, with more than half involving a biological mother (70%). Adolescent mothers are often at high risk for child maltreatment, and children under age one were most likely to be the victims of maltreatment (23.1%) (Lounds, Borkowski & Whitman, 2006; US DHHS, 2015). Children who were victims of maltreatment often suffer profound disturbances in their physical, cognitive, social, and emotional functioning (Font & Berger, 2014; Institute of Medicine and National Research Council (IOM & NRC), 2013).

² Parental depression is used synonymously with maternal depression and depression.

Although the reported rates of child maltreatment are alarming, many child maltreatment incidents actually remain unnoticed (DePanfilis, 2006; DePanfilis & Dubowitz, 2005). The Third and Fourth National Incidence Studies indicated that more than two thirds of child maltreatment incidents are likely to go unreported, partly due to the inconsistent interpretation of the current standardized definition of child maltreatment (DePanfilis, 2006; Sedlak, Mettenburg, Basera, Petta, McPherson, Greene & Li, 2010). In addition to its vague interpretation, child maltreatment is multidimensional; that is, abuse and neglect can occur in varying forms (e.g., physical abuse, sexual abuse, medical neglect, emotional neglect) for multiple of reasons (e.g., parental mental illness, poverty, marital conflicts), which further complicates the process of prevention and intervention. Child neglect, in particular, is significantly underreported due to its complex etiology and multiple forms it manifests (DePanfilis & Dubowitz, 2005; Tyler, Allison, & Winsler, 2006). The challenges in identifying and addressing child maltreatment often result in repeated perpetration of child maltreatment, further disrupting the development of children; as high as 67% of infants and children are re-reported for abuse and neglect (Proctor et al., 2012; Putnam-Hornstein, Simon, Eastman & Magruder, 2014). Given the substantial financial and social costs to U.S. society of dealing with parental depression and child maltreatment (Fang, Brown, Florence, & Mercy, 2012; Kessler et al. 2008; Soni, 2009; Wang & Holton, 2007), preventative action becomes critical. To create effective preventative intervention, we must first understand the etiology and developmental course of maternal depression and child maltreatment.

Depression, mothers, and children. In addition to health and social complications, mothers suffering from depression exhibit a depleted ability to interact and resolve conflicts with their children (Broth, Goodman, Hall, & Raynor, 2004; Caughy, Huang, & Lima, 2009; Dix,

Cheng, & Day, 2008). They often report a lack of competence in their parenting skills, lack of interest in child care, and fear of hurting their children (Beardslee, 2002; Hoffman, et al., 2006; NRC & IOM, 2009; Silver et al., 2006). In some cases, these parenting inadequacies could result in child maltreatment (Brodowski, 2012; Kohl, Kagotho & Dixon, 2011; NRC & IOM, 2009; Sheppard, 1997); the Fourth National Incidence Studies found that mental illnesses contributed to 7% of maltreatment cases (Sedlak et al., 2010), while other studies found that close to half of child welfare-involved parents suffering from major mood disorders such as depression (Burns et al., 2010; Marcenko, Lyons, & Courtney, 2011). When maternal depression and child maltreatment co-occur, such comorbidity not only devastates the life of a mother by putting her at risk for social disadvantages and life challenges, but it also puts her child at risk for severe emotional and physical harm (Sheppard, 1997).

There is strong consensus, both theoretically and empirically, that maternal depression contributes to serious biological, psychological, behavioral, and social consequences for young children (Hoffman et al., 2006; NRC & IOM, 2009; Paulson, Dauber & Leiferman, 2006). Compared to the children of non-depressed mothers, children of depressed mothers often exhibit various developmental challenges: physical complications (i.e., shorter length and smaller head circumference, lower weight, and postnatal complications) (Panzarine, Slater, & Sharps, 1995), lower cognitive functioning and academic achievements (Rhule, McMahon, Spieker, & Munson, 2006; Weed, Keogh, & Borkowski, 2006), social behavioral problems including less cooperativeness and lack of interest in activities (Cassidy, Zoccolillo, & Hughes, 1996; Field et al., 2000; Field, Diego, & Hernandez-Reif, 2009; Lanzi, Bert, Jacobs & The Centers for the Prevention of Child Neglect, 2009; Pelaez, Field, Pickens, & Hart, 2008), and psychopathology including depression (Bureau, Easterbrooks, & Lyons-Ruth, 2009). If not addressed early, these

behavioral and emotional challenges can continue into their early school years (Fihrrer, McMahon, & Taylor, 2009; Goodman & Aber, 2010; Hubbs-Tait et al., 1996; Koblinsky, Kuvalanka, & Randolph, 2006; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Maternal depression also can alter a child's neurological functioning by triggering atypical frontal brain activation and stress regulatory systems, which can permanently alter the course of a child's development (Dawson et al, 2001; Dawson et al., 2003; Jones, Field, & Davalos, 2000). Infancy and early childhood are periods when a child's brain is most susceptible and flexible to learning and growing. Thus, when experiences during these sensitive periods are severe and traumatic, a child's brain functioning may not recover completely even with later exposure to appropriate stimulation and environment (Korosi, & Baram, 2009; National Scientific Council on the Developing Child, 2007; Shonkoff, Boyce, & McEwen, 2009).

Adolescent parenthood and depression. It has been suggested that the impact of maternal depression may be more profound for adolescent mothers and their children compared to mothers who delay childbirth. The prevalence of depression among adolescent mothers is particularly alarming, with reported rates as high as 60% during the first year postpartum (Beers & Hollo, 2009; Lanzi et al., 2009; Logsdon, Simpson, Birkimer & Looney, 2005; Schmidt, Wiemann, Rickert & Smith, 2006; Wang, Wu, Anderson, & Florence, 2011). This rate is said to be double the rate of adult mothers as well as of adolescents with no children (Deal & Holt, 1998; Lindhorst & Oxford, 2006; Mollborn & Morningstar, 2009; Tzilos, Zlotnick, Raker, Kuo, & Phipps, 2012). Such experiences of maternal depression often persist, even when prevention and intervention services such as home visitation programs are available (Ammerman et al., 2009; Mayers, Hager-Budney, & Buckner, 2008).

This heightened risk for maternal depression can be particularly concerning. Early maternal depression can increase a young mother's risk for poor parenting during infancy and early childhood (Ammerman, Putnam, Bosse, Teeters & Van Ginkel, 2010; Field, 2010; Field et al., 2009; Lanzi et al., 2009; Lee, 2009; Lovejoy et al., 2000; Shay & Knutson, 2008). In particular, young mothers have an increased risk for child maltreatment, and the presence of depressive symptoms can amplify such a risk (DePanfilis, 2006; Sidebotham, & Golding, 2001; Whitson, Martinez, Ayala & Kaufman, 2011).

Complexity of the relation between maternal depression and child maltreatment.

Although it is well documented that young mothers are at an elevated risk for depression and poor parenting outcomes, including child maltreatment, the link between maternal depression and child maltreatment is still elusive (Choi et al., 2010; Zuravin, Bliss, & Cohen-Callow, 2005). Studies have found that although many of the families involved in the child welfare system were suffering from psychosocial disorders including depression (Burns et al., 2010; Marcenko et al., 2011), depression only explained a portion of the possible etiology of child maltreatment (Hecht & Hansen, 2001). Moreover, depressed mothers could often exhibit comparable parenting skills as did non-depressed mothers (Ruttenberg, Finello & Cordeiro, 1997), and young mothers, who were faced with multiple challenges, including depression, were still capable of making better life choices for themselves as well as for their children with appropriate support (Easterbrooks et al., 2010).

These findings suggest the complexity of the relation between maternal depression and child maltreatment, and that the presence of maternal depression itself may not be the sole contributor to the occurrence of child maltreatment. Given the multifaceted nature of depression, the way depression exhibits its symptoms can alter parenting behaviors. Furthermore, the early

onset of maternal depression and its influences on mothers' parenting during the early years of parenthood may further amplify the risk of child maltreatment. Particularly for adolescent mothers, their multiple roles and challenges may exacerbate their mental health issues in the context of ongoing parental stress. As Breheny and Stephens (2010) point out, the challenges of adolescent parenthood are as much about parenting with poor sets of resources as they are about maternal age. Therefore, understanding the complex association between maternal depression and child maltreatment requires an examination of other contributing factors related to maternal depression, parenthood, and child maltreatment (NRC & IOM, 2009). In particular, the recent focus of the child maltreatment prevention field has been on the protective factors that promote resilient parent functioning in the presence of contextual risks factors related to child maltreatment.

Contribution of protective factors in adolescent parenthood. Resilience is a “dynamic process that leads to positive adaptation within the context of significant adversity” (Werner, 2005, p.4). Positive parenting among adolescent mothers in the context of adversity (e.g., maternal depression) stems from a mother's own strengths as well as from environmental protective factors such as social support and resources that overcome or diminish the effect of risks and challenges they face. Furthermore, cultivating such protective factors during the earlier years is particularly critical in the early prevention and intervention of child maltreatment. It is argued that a young mother's readiness to parent, both cognitively and psychologically, could uniquely impact the way she parents, and that a young mother must be cognitively prepared (e.g., to think abstractly, discuss feelings, understand the consequences of their behaviors on their children) in order for her to parent effectively (Borkowski, Whitman & Farris, 2007; O'Callaghan, Borkowski, Whitman, Maxwell, & Keogh, 1999). Recent research emphasizes

that a mother's mentalization of her parental experiences, specifically her recognition of her child as an individual being with an independent state of mind, is a critical aspect of parental cognitive maturity that may influence parental behaviors and child outcomes (Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Meins, 1997; Slade, 2005; Slade, Belsky, Aber, & Phelps, 1999). Unfortunately, research on maternal mentalization in relation to adolescent parenthood is still limited.

For adolescent mothers, who tend to be limited in social resources, support from family, spouse/partner, and friends during the time of stress is also thought to alleviate the likelihood of maternal depression and promote positive parenting and child development. In particular, the importance of romantic relationships during adolescence (Collins, 2003) highlights the impact of a male partner or the father of the baby on adolescent mothers' functioning. While there is an exhaustive amount of literature on the impact of support provided by maternal grandmothers (Davis, 2002; Mitchell & Green, 2002; Sellers, Black, Boris, Oberlander, & Myers, 2011; Unger & Cooley, 1992), research on the role of support provided by a partner is limited (Beers & Hollo, 2009). This gap in the literature on partner relationships is even more problematic when attempting to understand the role of partner support when young mothers are depressed.

Formal supports provided through public service programs can also assist adolescent mothers' functioning. Among many available services, home visitation has been one of the more prominent forms of supports that have shown success in engaging young mothers and promoting positive parental functioning (Avellar & Supplee, 2013; Daro & Dodge, 2010). It is considered a cost effective service delivery approach that can bring services to socially or geographically isolated families during the early years (Gomby, 2005). Unfortunately, studies show that the presence of maternal depression can attenuate the potential effect of parenting programs for

young parents (Ammerman et al., 2010; Chazan-Cohen et al., 2007; Easterbrooks et al., 2013).

Although maternal depression tends to be prevalent among mothers receiving home visiting services, home visiting programs are often unable to adequately address depression (Ammerman et al., 2009; Duggan et al., 2007), leaving more questions about the effectiveness of home visitation programs when the experiences of depression are hugely variable across individuals.

Study Aims

In an effort to further understand the link between maternal depression and child maltreatment, this dissertation tested a theoretical model in which different hypotheses about the link between maternal depression and child maltreatment were considered. The first hypothesis tapped into the multidimensional nature of depression by examining different longitudinal profiles of maternal depression, with varying chronicity and severity, that may account for the complexity of the link between maternal depression and child maltreatment. This study also considered early parenting behavior as an important precursor to the occurrences of child maltreatment. Finally, this research explored the role of several hypothesized protective factors (maternal mentalization, mother-father relationship, home visiting program utilization) that may promote positive early parenting in the presence of depressive symptoms, which in return could reduce the occurrences of child maltreatment.

Theoretical Framework: Maternal Depression, Adolescent Parenthood, and Child

Maltreatment

Research on child maltreatment often is guided by theories that focus on the ontogenetic causes such as maternal psychopathology, including depression. However, such a singular claim is arguable since not all depressed mothers are abusive or neglectful. The complex nature of maternal depression and child maltreatment emphasizes the importance of a multidimensional

approach to understanding the link between them. The bio-ecological perspective acknowledges the importance of the reciprocal interactions between an individual's characteristics and environmental contexts and suggests that an individual's development is influenced by the presence of risk and protective factors across contexts (Bronfenbrenner & Morris, 2006; Cicchetti & Toth, 1995). That is, the mere presence of maternal depression does not determine parenting outcomes; rather, the impact of maternal depression can be determined by how it interacts with the risk and protective factors that exist in multiple contexts. This perspective foregrounded the idea that understanding the complex association between maternal depression and child maltreatment requires an examination of multiple factors that may influence how maternal depression relates to child maltreatment.

To decipher the determinants of parental functioning, Belsky (1984) used the ecological framework to create a model that included parental characteristics, child characteristics, and sociocultural context in which a parent and a child resided. The model suggested that parental functioning is determined both directly and indirectly by the interactions among risk and protective factors that exist in each of these components (Afifi, 2007; Belsky, 1984). His model considered the developmental history, parents' personality, and the existence of social support as particularly influential sources of parenting (Afifi, 2007; Belsky, 1984; Copeland & Harbaugh, 2010).

Schellenbach, Whitman, and Borkowski (1992) modified Belsky's (1984) model of parenting to fit the unique characteristics of adolescent parenting (Afifi, 2007). While following Belsky's (1984) model structure, the authors focused on characteristics unique to adolescent parents and their children, parent-child interactions, and the support systems (Afifi, 2007). In particular, they included four major characteristics that are critical to adolescent parenthood:

learning ability, cognitive readiness for parenting, psychosocial adjustment, and maternal health (Afifi, 2007; Schellenbach et al., 1992). While empirical research supports the components of their revised model in understanding adolescent parenthood (Budd, Heilman, & Kane, 2000; O'Callaghan et al., 1999; Malo, Moreau, Chamberland, Leveille & Roy, 2004), the model has a limitation in addressing the etiology of child maltreatment among young mothers as it focuses primarily on the process of parenting and child development in general (Afifi, 2007).

Using his earlier model on parenting, Belsky (1993) developed a developmental-ecological model of child maltreatment. Because he emphasized the complex nature of child maltreatment etiology, he encouraged the use of multivariate approaches to studying child maltreatment (Afifi, 2007). Belsky's model included three contexts: 1) the developmental-psychological context (e.g., parental and child characteristics), 2) the immediate context (e.g., parent-child interactions), and 3) the broader context (e.g., culture, community) (Afifi, 2007; Belsky, 1993). While these contexts have been examined individually in relation to child maltreatment and have been supported empirically (Banyard, Williams, & Siegel, 2003; Barrett & Turner, 2005; Berger, Paxson & Waldfogel, 2009; NRC & IOM, 2009), using this model in its entirety can be difficult for adolescent parents, partly due to broadly defined contexts (Afifi, 2007).

Incorporating the important aspects of Belsky's (1993) developmental ecological framework of child maltreatment and Schellenbach et al.'s (1992) model of adolescent parenting, Afifi (2007) filled a theoretical gap by proposing a model of child maltreatment and adolescent parenting. While organizing the model using Belsky's (1993) three contexts (developmental-psychological, immediate, and broader contexts), Afifi (2007) incorporated Schellenbach et al.'s (1992) important elements of adolescent parenthood. In Afifi's (2007) proposed model, the

developmental psychological context included psychological adjustment, cognitive readiness to parent, learning ability, psychological well-being and maternal health. The immediate context included social support, parenting style, parent-child interactions, and marital relations. The broader context included parental education, employment, culture, income, religion, and division of house labor. Afifi (2007) states that maternal depression may be a predisposition that puts adolescent parents at risk for child maltreatment. The likelihood of child maltreatment may diminish if adolescent parents are able to manage their depressive symptoms, allowing them to increase their ability to parent. This again emphasizes the role of factors that can either exacerbate maternal depressive symptoms or mitigate the impact of maternal depression in the stressful context of parenting.

Conceptual Framework of the Study

These theoretical frameworks have guided the field's understanding of adolescent parenthood and child maltreatment prevention. However, I echo Afifi's (2007) comment that examining many of these theoretical models in their entirety can be difficult, partly due to the multiple layers involved in defining the contexts and constructs. Therefore, to further clarify the link between maternal depression and child maltreatment among adolescent mothers, the conceptual model used in this dissertation adapted Afifi's (2007) model of child abuse and adolescent parenting, Belsky's (1984) model of parenting, and the Schellenbach et al.'s (1992) model of adolescent parenting (Figure 1). In particular, several factors that are most salient and uniquely relevant to maternal depression, adolescent parenthood, and child maltreatment were specifically chosen from the above mentioned theoretical frameworks based on empirical evidence available in the field. Furthermore, given the evidence of resilient parenting among adolescent mothers, this conceptual model focused on the protective factors that might mitigate

the impact of maternal depression on parenting. The factors involved in the conceptual framework are discussed in the following sections. A single-headed arrow indicates a predictive relation between two constructs, and a dot indicates a moderating effect of a factor.

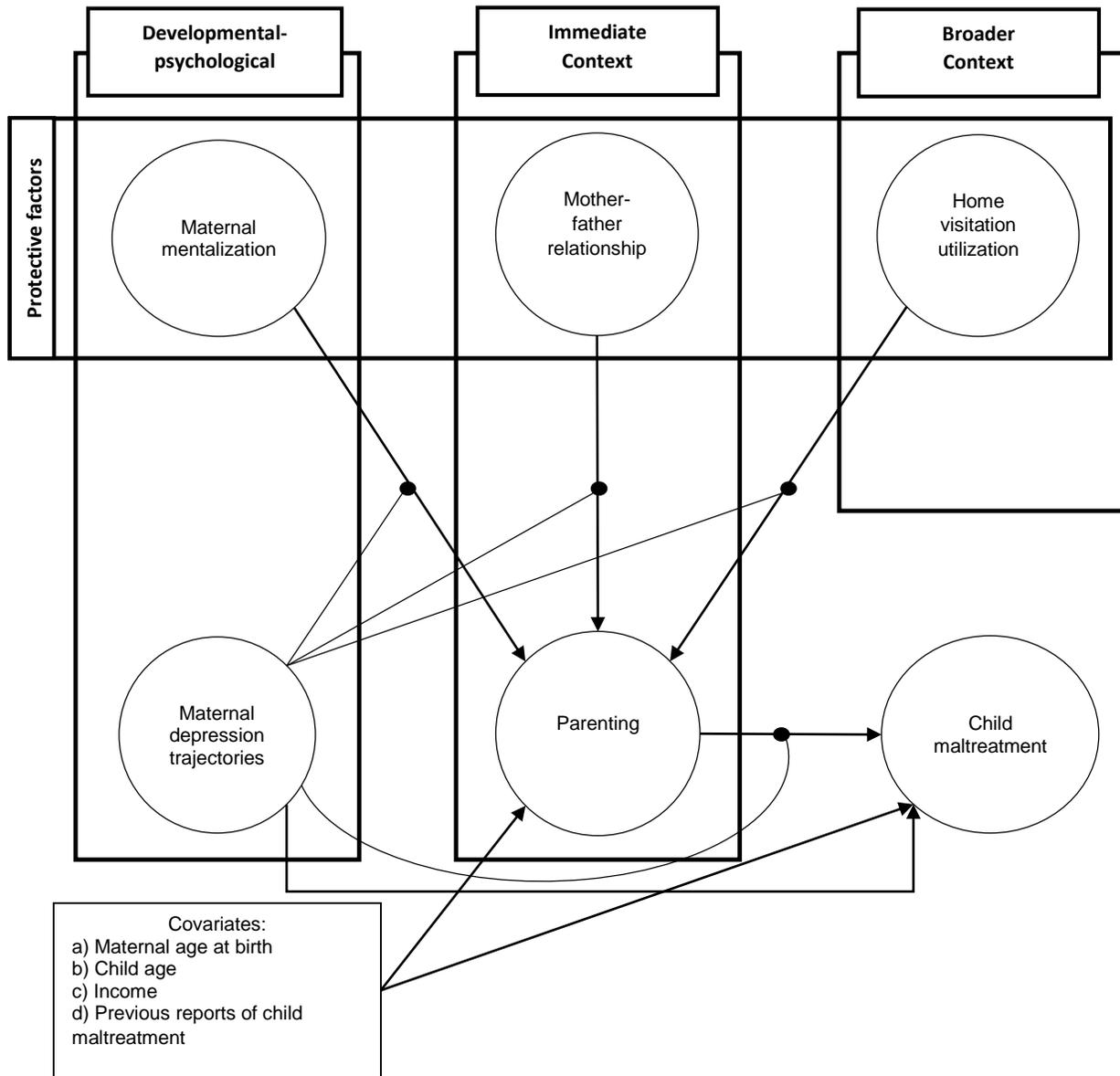


Figure 1. Conceptual framework for maternal depression, adolescent parenthood, and child maltreatment.

As illustrated in Figure 1, the conceptual model incorporated three contexts from Afifi (2007) and Belsky (1993) (developmental-psychological, immediate, and broader contexts) that may influence the relations between maternal depression and child maltreatment. The protective factor within the developmental-psychological context is the adolescent mothers' cognitive readiness to parent that is deemed critical to promoting positive attitudes and sensitive parenting among adolescent parents (Beers & Hollo, 2009; Schellenbach et al., 1992). Given the recent attention on how parents understand, reflect on, and discuss their role as parents as well as on their children's mental states (Fonagy, et al., 1991; Meins, 1997; Slade, 2005; Slade et al., 1999), this study focused on maternal mentalization, which is a mother's ability to recognize her child's mental state when interacting with her child.

The two factors included in the immediate context are parenting and mother-father relationship quality. Parenting construct used in this study encompasses parents' sensitivity, patience, responsiveness, and acceptance towards their children during their dyadic interactions. The quality of parenting is often related to child maltreatment (Choi et al., 2010; Hien, Cohen, Caldeira, Flom & Wasserman, 2010; Munz, Wilson & D'Enbeau, 2010; Rodriguez, 2010). The mother-father relationship is included as a protective factor that has been known to promote healthy maternal functioning including positive parenting (Beers & Hollo, 2009; Bunting & McAuley, 2004; Huang & Lee, 2008; McDowell & Parke, 2005). The study examined the impact of broader context by including the mothers' participation in a preventive home visitation program. To identify the unique contributions of the constructs that are being analyzed, the model included two maternal characteristics as covariates: mother's age at first birth and income; younger maternal age and low income are both known to be associated with higher rates of child maltreatment (US DHHS, 2015). Children's characteristics were not examined specifically in

this dissertation as the focus was on the mothers. However, a child's age at the data collection was included as a covariate in the study to control for the effect of a child's developmental stage (e.g., whether mom is pregnant, parenting an infant, or parenting a toddler) on parenting. Furthermore, the pre-existing child maltreatment reports filed was included as a covariate to account for the pre-existing involvement with child welfare system.

It is acknowledged that distal and proximal factors are likely to differ in their degrees of influence, with the level of ecology closest to the child being most influential (Cicchetti, 2004; Stith et al., 2009). That said, isolated factors are not the sole contributors to the etiology of child maltreatment (Belsky, 1993); rather, examining factors in conjunction with other contributing variables yields a more salient picture of how these factors play a role in linking maternal depression and child maltreatment. Thus, the proposed conceptual model examined the impact of maternal depression on child maltreatment in conjunction with other relevant factors. The next chapter reviews the relevant, existing literature on maternal depression, adolescent parenthood and child maltreatment.

CHAPTER TWO: LITERATURE REVIEW

The first section of this chapter reviews existing literature on maternal depression and child maltreatment, for both adult and adolescent mothers, and discusses the inconsistent findings in the literature. The second section of this chapter examines three possible explanations that may account for this inconsistency. It begins by considering that the chronicity and severity of maternal depression may account for the varying links between maternal depression and child maltreatment. The section continues with the discussion of early parenting as a precursor to child maltreatment and ends with the examination of the three hypothesized protective factors (maternal mentalization, mother-father relationship, home visiting program utilization) that may determine the course of the effect of maternal depression on parenting. The third section of this chapter reviews methodological challenges present in existing literature. Finally, the last section of this chapter provides an overall summary of the literature reviewed and presents the research questions and hypotheses for this dissertation.

Maternal Depression as a Predictor of Child Maltreatment

An individual who is depressed tends to face numerous challenges, from employment difficulties to emotional instability (Kessler et al., 2003). When this depressed individual is a mother, her struggles also affect her parenting. Mothers who are depressed often suffer from unhealthy thoughts of harming their children (Jennings, Ross, Popper & Elmore, 1999). They also have unrealistic expectations and negative impressions of their children's growth and behaviors (Cornish et al., 2006; Weissman et al., 2004). Such a negative thought process can limit mothers' ability to successfully bond with their children, putting depressed mothers at risk for inadequate parenting.

Indeed, studies show that the presence of depressive symptoms is commonly observed among mothers who are involved in the child welfare system, and the prevalence of parental depression is higher for maltreating parents than non-maltreating parents (Burns et al., 2010; Casanueva, Cross, Ringeisen & Christ, 2011; Kohl et al., 2011; Mammen, Kolko & Pilkonis, 2003; Marcenko et al., 2011). Casanueva et al. (2011) found that about half of the participating caregivers who were involved in the child welfare system suffered from depression; this represents approximately three times the rate of national estimates (Kessler et al., 2005). Moreover, many of the caregivers experience depression chronically, possibly perpetuating their involvement with the child welfare system. Kohl et al. (2011) examined a nationally-representative random sample of families involved in the child welfare system and found that approximately one in five mothers met the diagnostic criteria for depression at baseline, and such a rate was relatively stable across time.

Given the high prevalence and recurrent nature of depression among maltreating caregivers, it is plausible that the presence of maternal depression can put a mother at risk for maltreating her child. Mammen et al. (2003) found that parental depression was linked to aggressive parental behaviors among families who were involved in the child welfare system. Zuravin (1989) examined both mothers who were involved in the child welfare system and those who were not, and found, in both samples, that maternal depression was linked to physical aggression and abusive behaviors. Kohl et al. (2011) also found that maternal depression was linked to an increased risk for emotional maltreatment and neglect, but not for harsh parenting, over a 36-month study period among caregivers of children between ages three and 10 who were involved in the child welfare system. Kohl, Jonson-Reid and Drake (2011a) followed these families for over 10 years and found that the rate of recurrent maltreatment was high (over two

thirds of families had new reports across time), especially for mothers with mental illnesses. Mothers with mood disorders and anxiety disorders especially had a higher rate of new reports, and they had a shorter time interval to subsequent reports than for families with emotionally healthy mothers (Kohl et al., 2011a). Proctor et al. (2012) also found that parental depression predicted repeated reports that occur within the first six years of children's lives. These findings suggest that maternal depression not only increases the risk of child maltreatment, but its persistent nature of symptoms can also increase the likelihood of mothers repeating the offense at later times, especially in the early years of parenthood. Moreover, maternal depression could also put a child at risk for maltreatment by diminishing a mother's ability to shield her child from being maltreated by others, elevating the concerns for having a depressed individual as a caregiver (Mannarino, Cohen, Deblinger & Steer, 2007).

The presence of maternal depression during the early years of parenthood may be particularly concerning. According to Mustillo, Dorsey, Conover and Burns (2011), a link between maternal depression and neglectful parenting behaviors was significant for families who were reported for maltreatment with preschool and school aged children, but not for adolescents. Furthermore, Kotch et al. (1995) found that parental depression predicted a higher incidence of maltreatment reports during the first year postpartum, and their follow-up study found that the previous maltreatment report during the first year predicted recurrent substantiated reports during the second and third year (Kotch et al., 1997). The authors argued that the significant link between previous maltreatment reports and the subsequent years' reports would suggest that the risk factors that existed in the early years, including parental depression, would remain as risk factors for subsequent maltreatment. Putting these study findings together, it is plausible that the impact of maternal depression on child maltreatment remains significant during the early

childhood years, and the experiences of child maltreatment during these years can potentially become a risk factor for child maltreatment in the subsequent years. Young children are physically vulnerable and have limited interactions with other adults (Wulczyn, Barth, Yuan, Jones, Harden, & Landsverk, 2005). Furthermore, they also face the highest risk of being maltreated (US DHHS, 2015). Hence, these study findings could suggest that the presence of maternal depression is particularly detrimental to younger children, and may help to set a detrimental developmental course for parents and children. Unfortunately, despite the advances in the research on risk and protective factors (Slack et al., 2011), infancy is still an understudied period in the literature on child maltreatment (Bartlett, Raskin, Kotake, Nearing & Easterbrooks, 2013; Brodowski et al., 2008).

The heightened concern for maternal depression is further evidenced in the studies that examined the link between maternal depression and child maltreatment in community samples (Chung, McCollum, Elo, Lee & Culhane, 2004; Lyons-Ruth, Lyubchik, Wolfe, & Bronfan, 2002; Zajicek-Farber, 2009). Windham and colleagues (2004) found that maternal depression was related to severe physical assault against children, and Schuetze and Eiden (2005) found that depressed mothers who were sexually abused as children used more punitive disciplining strategies that involved spanking and yelling. Cohen, Hien and Batchelder (2008) also found that maternal depression was related to child abuse potential. It is important to note that the samples in these community studies were an “at-risk” population, who faced multiple environmental (e.g., low income) and personal challenges (e.g., substance abuse, childhood abuse, mental illness). Therefore, mothers who have multiple contextual risks in addition to depression may be at an elevated risk for child maltreatment. This encourages further investigation of factors that may contribute to the link between maternal depression and child

maltreatment. One such risk factor is adolescent parenthood; the next section discusses the heightened risk of maternal depression and child maltreatment among adolescent mothers.

Risk of child maltreatment among depressed adolescent mothers. Mothers' younger age at first birth is often found to be linked to a higher child abuse potential or frequent involvement with the child welfare system (Ammerman et al., 2009; Beers & Hollo, 2009; Colletta, 1983; Connelly & Straus, 1992; Fallon, Ma, Black & Wekerle, 2011; Lee & Goerge, 1999; Schmidt et al., 2006; Stier, Leventhal, Berg, Johnson & Mezger, 1993). One study found that about 40% of children of teen mothers were identified as victims of maltreatment (Black, Papas, Hussey, Dubowitz, Kotch & Starr, 2002)³, and infant mortality rates were also found to be higher for younger mothers (Phipps, Blume & DeMonner, 2002). Especially for adolescent mothers facing multiple life challenges, an occurrence of child maltreatment was not uncommon (Budd et al., 2000; Stevens-Simon & Barrett, 2001). Zuravin and DiBlasio (1992) specifically compared teenage mothers who were and were not involved in the child welfare system, and found that those who were involved in the child welfare system tended to be younger at first birth, had a lower education, had been sexually abused as a child, were raising more children, and had an experience of a premature birth. Therefore, being a teen parent itself may be an insufficient explanation for the higher risk of child maltreatment associated with adolescent parenthood.

Given the high prevalence of depression among adolescent parents, maternal depression is a plausible factor that may account for the elevated risk of child maltreatment among young mothers. Studies found that young mothers who showed a higher rate of child abuse and neglect potential were more likely to be emotionally distressed, suggesting that young, depressed

³ A child was considered a victim of child maltreatment, regardless of whether the allegation was substantiated or not.

mothers may have a higher likelihood of maltreating their children (Budd et al., 2000; Zelenko, Huffman, Lock, Kennedy & Steiner, 2001). In fact, Fallon et al. (2011) found that among young parents who were investigated for child maltreatment concerns, young mothers who tended to suffer from mental health complications and had limited social support had a higher likelihood of having open cases where services were provided by the child welfare system. The presence of depression may be particularly harmful for younger mothers with limited resources. Very young (e.g., age 14-17) married teen mothers with less than high school education had the strongest link between maternal depression and neglectful, hostile behaviors and rejection of their children (Colletta, 1983). Such an association may linger on when children are older; Lee (2009) found among mothers who gave their first birth as a teenager, their depressive symptoms during first year were related to physical aggression, but not spanking, towards their children at the third year follow-up.

Although a strong argument could be made for the role that maternal depression plays in the occurrence of child maltreatment among young mothers, it is too early to make the declaration that maternal depression “causes” a young mother to maltreat her child. First of all, study on the mechanism behind maternal depression and child maltreatment among young mothers is still limited, partly due to limited accessibility to this particular population for research. Moreover, it is uncertain whether child maltreatment is primarily dependent upon maternal psychological functioning or better explained by its interaction with other, or additional, contextual factors.

The uncertainty in the role of maternal depression is presented in the literature on both adult and young mothers, where studies found no associations, or rather more complex associations, between maternal depression and child maltreatment (Choi et al., 2010; Cohen et

al., 2008; Hien et al., 2010; Leschied, Chiodo, Whitehead & Hurley, 2005). For instance, Leschied et al. (2005) found that the rate of child maltreatment was no different between mothers who were depressed and who were not depressed. Down and Coyne (1990) also indicated that some of the parenting difficulties were also faced by non-depressed mothers, emphasizing the equifinality of maladaptive parenting behaviors. In fact, Choi et al. (2010) found that maternal depression predicted mothers' fear of abusing their children, but not the actual abusive behavior. Similarly, Cohen et al. (2008) found that maternal depression was significantly related to abuse potential, but not to the actual harsh parenting behaviors. Such findings could suggest that despite a mother's harmful thoughts, some factors present in a mother's life may have prevented her from acting on her thoughts. Mennen and Trickett (2011) found opposite results from Choi et al. (2010) and Cohen et al. (2008), but similarly suggested that maternal depression itself may not be the sole contributor to harmful parenting; they found that maternal depression was related to maltreatment, but maltreating mothers did not endorse corporal punishment. Maltreating mothers in this study were also of low income, so although they might recognize the inappropriateness of corporal punishment, their limited mental health functioning and resources may have pushed them to resort to physical aggression towards their children. Thus, the presence of maternal depression itself may not lead to the thoughts or acts of maltreating a child, but perhaps acts as an underlying factor that makes a mother with multiple challenges vulnerable to such maladaptive parenting attitudes and behaviors, unless some factors are present to prevent these maladaptive behaviors among depressed mothers.

Although still limited in number and scope of studies, the literature on adolescent motherhood proposes a similar complexity behind maternal depression and child maltreatment. While studies have found no differences between young mothers who were depressed and not

depressed in their engagement in harmful parenting behaviors such as physical spanking and child maltreatment (Combs-Orme and Cain, 2008; Kinard, 2003), Spieker, Gillmore, Lewis, Morrison, and Lohr (2001) found that young mothers' psychological distress during the first five years of children's lives was related to negative control (e.g., yelling, spanking) by the mothers when children were six years old, but this was only significant for mothers who were not abusing alcohol. Those who were abusing alcohol exhibited a high use of negative control regardless of their depression levels. In fact, Easterbrooks et al. (2010) found that young mothers who showed resilient parenting functioning and did not perpetrate maltreatment were more likely to have high depressive symptoms, suggesting that young mothers can parent well, even in the presence of their depressive symptoms, and the role of maternal depression may vary depending on the presence of other contributing factors.

In sum, the association between maternal depression and child maltreatment is complex and the mere presence of maternal depression is insufficient to explain the perpetration of child maltreatment by both adult and young mothers. In fact, families who are involved in the child welfare system often face multiple challenges; thus, perhaps it is the combination of risk factors, or lack of protective factors, that puts a mother who is depressed at risk for child maltreatment. As a result, we must consider, identify, and understand the multidimensional contexts that contribute to the onset and maintenance of such maladaptive parenting behaviors.

Beyond the Effects of Maternal Depression

Child maltreatment is best understood from an ecological perspective, where an individual's behaviors are determined by the interactions between risk and protective factors that exist within multiple contexts (e.g., individual, family, community, culture) (Belsky, 1993; Cicchetti & Toth, 1995; Gilbert, et al., 2009). Nair, Schuler, Black, Kettinger, and Harrington

(2003) and Begle, Dumans, and Hanson (2010) both found that the presence of cumulative risks, rather than one single risk factor, elevated the risk for child maltreatment, suggesting that rather than the presence of maternal depression itself, the existence of cumulative risks, or the absence of protective factors, in combination with the presence of maternal depression, may make a mother vulnerable to engaging in child maltreatment. Moreover, behavioral outcomes of such an ecological interplay may differ depending on the developmental stage of a mother (Cicchetti & Toth, 1995). Therefore, for an adolescent mother, who is in the midst of exploring her own identity and juggling the responsibilities of being a teenager as well as a parent, what determines the perpetration of child maltreatment may be more complex and different from an adult mother. Thus, it becomes critical to examine the factors that may be most relevant to adolescent mothers that may impact the link between maternal depression and child maltreatment.

Child maltreatment is also multidimensional with various forms of abuse and neglect. These varying ways in which maltreatment is manifested often hold complex etiology, and while they share some common contributing factors, they often hold distinct sets of risk factors (Chaffin, Kelleher & Hollenberg, 1996). That is, a certain risk factor may be a stronger predictor for a certain type of maltreatment. Available studies have found mixed results in the role of maternal depression in predicting child physical abuse and neglect; among families involved in child welfare system, some studies found that the presence of maternal depression was linked to neglectful parenting, but not to other types of abuse (Kohl et al., 2011; Mustillo et al., 2011), whereas other studies have found it to be linked to reports of physical abuse and psychological aggression, but not to neglect (Chaffin et al., 1996; Conron, Beardslee, Koenen, Buka & Gortmaker, 2009). Similar inconsistencies have been found in the population of adolescent mothers (Bartlett et al., 2013; Zuravin & DiBlasio, 1996).

Unfortunately, empirical research on the etiology of maltreatment has often focused on the abuse of older children or examined abuse and neglect collectively as a single category of “child maltreatment” (Bartlett et al., 2013; Dubowitz, 2007; Erickson & Egeland, 2002; Manly, Kim, Rogosch, & Cicchetti, 2001). Furthermore, despite being the most common form of maltreatment among very young children of adolescent mothers (Bartlett et al., 2013; Lounds et al., 2006), the etiology of neglect during the period of infancy is often understudied (DePanfilis & Dubowitz, 2005). Emphasizing the importance of understanding causal mechanisms of child maltreatment, especially of neglect, to move prevention effort forward, Bartlett et al. (2013) examined child, family, and broader environment factors in predicting the onset of neglect among adolescent mothers, with maternal depression being one of the examined factors. The authors found that although maternal depression was a significant predictor of neglect when examined independently, it was not associated to neglect when other contextual factors such as income and partner violence were taken into account. The inconsistency in the relations found between depression and child maltreatment may suggest that the effect of maternal depression may be confounded by other variables. Furthermore, maternal depression may be an underlying factor that may make adolescent mothers vulnerable to child maltreatment when presented with other contextual stressors. Further examination of the relations between maternal depression and child maltreatment, thus, becomes critical in generating additional evidence in supporting prevention of child abuse and neglect.

Based on the theoretical and empirical findings relevant to maternal depression, child maltreatment, and adolescent parenthood, I present three hypothesized explanations in the following sub-sections. The first sub-section discusses the *chronicity and severity of maternal depression* that may differentiate the impact of maternal depression on child maltreatment. *Early*

parenting is also considered as a precursor to child maltreatment. Finally, I focus on the strength of adolescent mothers by considering the *buffering effects of hypothesized protective factors* (*maternal mentalization, mother-father relationship, home visiting program utilization*) that may promote positive early parenting and break the link between maternal depression and child maltreatment among young mothers.

Chronicity and severity of maternal depression and child maltreatment. The effects of maternal depression on child maltreatment could be further understood by investigating the chronicity and severity of depressive episodes. As mentioned earlier, the experience of depression varies significantly from person to person; some mothers experience depressive symptoms such as fatigue, hopelessness, and lack of interest in life activities for an extended period of time, while others experience these symptoms only briefly. The severity of the symptoms can also differ, as some parents can have all the symptoms, while some only experience a select few symptoms. Therefore, such variability in the experiences of depressive symptoms may explain why some mothers have difficulty with their symptoms, while some can exhibit positive parenting in the presence of their depression.

While many mothers recover from depression soon after their children's birth, those who suffer elevated depressive symptoms often suffer chronically (Beeghly et al., 2002; Goodman, 2004; Horwitz, Briggs-Gowan, Storfer-Isser, & Carter, 2009). Beeghly et al. (2002) found that first-time mothers who suffered higher depressive symptoms at two months postpartum were more likely to continue experiencing elevated depressive symptoms throughout the first year postpartum. Such persistence of depressive symptoms may also continue years after giving birth, particularly for those who suffer high levels of depressive symptoms early on in the first year postpartum (Goodman, 2004; Leadbeater, Bishop, & Raver, 1996). Young mothers are

particularly at risk for early and chronic depression (Wang et al., 2011). They often experience risk factors that are related to the chronic experience of maternal depression including lower education, higher anxiety, higher parenting distress, and lower level of social support (Horwitz et al., 2009). In particular, studies found that caregivers who maltreated their children often suffered from chronic depression, suggesting a detrimental effect of elevated depression when experienced for an extended period of time (Casanueva et al., 2011; Conron et al., 2009; Kohl et al., 2011).

Although studies often do not examine the impact of the trajectories of maternal depression (Goodman & Gotlib, 1999), and trajectories of maternal depression have not been focused enough in the literature on child maltreatment, the available research on parenting suggests that the effects of a mother's depressive symptoms on her parenting may be particularly pronounced when symptoms are experienced in chronic and severe forms (Conron et al., 2009; Sohr-Preston & Scaramella, 2006). For instance, Campbell, Cohn and Meyers (1995) found that depressed and non-depressed mothers showed no difference in how they interacted with their children at two months postpartum, but mothers who experienced depression at both two months and six months postpartum were less positive and less engaged with their six-month old children than were non-depressed mothers. A study that examined a national sample of mothers who reported low, intermittent or chronic depression between one month and 36 months postpartum found that chronically depressed mothers were the least sensitive during the observed play sessions with their children and showed a decline in sensitivity at the second year assessment (NICHD Early Child Care Research Network, 1999). Another study that examined a national sample of mothers and children further investigated the trajectories of maternal depression from one month to when children were in first grade and found six patterns of depression trajectories:

low stable, moderate stable, intermittent, moderate increasing, high decreasing, and high chronic (Campbell, Matestic, Von Stauffenberg, Mohan & Kirchner, 2007). These authors reported more nuanced results; mothers exhibited negative interactions with their children when depression was experienced more severely and chronically. However, when mothers had stable, but moderate depressive symptoms, they showed relative sensitivity in their interactions with their children (Campbell et al., 2007). These findings suggest that the duration and severity of depressive episodes are critical to understanding why parents behave a certain way; depression could be experienced at a varying rate among mothers, and when it is experienced at a severe and chronic level, it could hinder their parenting.

The detrimental effect of chronic maternal depression is further confirmed in a study on low-risk population (e.g., higher education, middle class income) (Cornish et al., 2006). While an experience of maternal depression in general was related to overall parental stress, only chronic depression was linked to higher parental distress about a child's characteristics and more hostile feelings towards their children. Considering that this particular sample in the study did not experience some of the risks related to maternal depression and poor parenting, this finding further illustrates the potential impact of chronic maternal depression. Furthermore, the study findings showed that the target of parental stress was the child, which could suggest that mothers' frustration could potentially get aimed towards their children, resulting in maltreatment.

The persistent experience of elevated maternal depression at an early stage of a child's life can have an enduring effect on parenting and on a child's development. For instance, maternal depression experienced prenatally was associated with a higher likelihood of experiencing postpartum depression (Deave, Heron, Evans, & Emond, 2008; McLearn, Minkovitz, Strobino, Marks & Hou, 2006; Milgrom et al., 2008; Robertson, Grace, Wallington,

& Stewart, 2004). Foster, Garber and Durlak (2008) examined the contribution of past and current depressive symptoms on mothers' interaction with their adolescent offspring, and found that a history of chronic and severe maternal depression during their children's childhood predicted a higher level of current maternal depressive symptoms, which in turn predicted fewer positive interactions between mothers and their adolescent offspring. These children also experienced increased risk for externalizing behavioral problems. Such enduring effects of early and chronic maternal depression further accentuates the importance of early intervention and regular screening for depressive symptoms.

The effect of chronic and severe maternal depression also is evident among adolescent mothers. For instance, Colletta (1983) found that compared to non-depressed mothers, adolescent mothers who experienced depression chronically or intermittently during the 12 months postpartum were unhappy with how they parented. Leadbeater and Linares (1992) found similar results, but revealed a difference between mothers who were chronically depressed and intermittently depressed; mothers who were chronically depressed during first year postpartum were more likely to be stressed, lived alone, and had more frequent moves than mothers who experienced no or intermittent depressive symptoms. These findings suggest a risk for long term complications among young mothers who experience depression chronically, but may require further exploration of depression trajectories and its impact.

A more nuanced exploration of maternal depression among adolescent mothers is also critical because of the complex nature of depression experienced by this population. While a study showed an overall stability of Black adolescent mothers' depressive symptoms over time (Leadbeater, et al., 1996), a similar sample of Black adolescent parents in another study showed a decrease in depression related to somatic symptoms (Leadbeater & Linares, 1992). No change

was found in the cognitive and affective symptoms. Another study that explored a more diverse group of adolescent mothers reported a relative decrease in their depressive symptoms across three years, with some exhibiting chronic depression across time (Jacobs, Easterbrooks, Brady & Mistry, 2005). A study by Ramos-Marcuse et al. (2011) further looked at the impact of maternal depression on parental satisfaction across two years postpartum by examining the prevalence and patterns of depressive symptoms among urban, low-income, first-time, African American adolescent mothers. They found three profiles of maternal depression: mothers who had consistently high depressive symptoms, mothers who hovered around the clinical cut-off, and mothers who did not exhibit any depression across the first two years of their children's lives. The authors found that mothers who were chronically and clinically depressed exhibited low parenting satisfaction and self-esteem at 24 months. Moreover, other previous studies showed that severity (having more depressive symptoms) at one episode did not impact young mothers' parenting, but that chronicity (having experienced depression at clinical level at multiple points in time) diminished their ability to interact with their children effectively and sensitively (Leadbeater et al., 1996; Lesser & Koniak-Griffin, 2000).

In sum, these findings suggest the heterogeneity of depression experienced by adolescent mothers. They also suggest the differential impact of maternal depression on their parenting when experienced at different degrees of severity and duration. Therefore, it is critical to decipher how the chronicity and severity of maternal depression can impact young mothers' behaviors since such information can help develop more precise tools to support those who are suffering depression at different levels of severity and chronicity. Furthermore, the detrimental impact of chronic and severe maternal depression highlights the importance of intervention during the early years of parenthood, emphasizing a better understanding of early indicators,

particularly early parenting, of depressed mothers that may help prevent the occurrence of child maltreatment all together.

Early parenting as a precursor to child maltreatment. Maternal depression is often linked to poor parenting (e.g., lack of sensitivity, empathy) (Field et al., 2000; Mcfadden & Tamis-LeMonda, 2013), and parents who perpetrate maltreatment often have been described as depressed and insensitive (Casady & Lee, 2002; Munz et al., 2010; Rodriguez, 2010; Rogosch, Cicchetti, Shields & Toth, 1995). Therefore, the available evidence suggests that parenting is associated with maternal depression and plays a role in linking maternal depression and child maltreatment. That is, maternal depression interferes with a mother's capacity to provide a nurturing and caring environment for her child, which in turn contributes to child abuse and neglect.

Before proceeding to reviewing the relevant study findings, it is important to note the distinction made between parenting and child maltreatment in this dissertation. Belsky (1993) raised a critical question when looking at the etiology of child maltreatment; “[Do ways in which parents care for and interact with their children] reflect proximal causes of child abuse and neglect and thus deserve to be considered as part of the etiological equation, or are [they] the very phenomenon [of child maltreatment] to be explained” (p. 420). In this dissertation, I define parenting as the former; parenting is an indicator for the maltreating act of a mother. Parenting encompasses various components including the knowledge of childrearing that parents possess, how parents think and view about their childrearing responsibilities, and how parents interact with their children. These components are expressed differently by each parent and these *tendencies* in how a parent thinks and behaves can push a parent to engage in abusive and neglectful acts, when other contributing factors are present (Belsky, 1993). For instance, Vasta

(1982) suggested that what begins as an act of physical discipline has the potential of turning into an act of physical abuse when a parent is unable to control his or her disciplining behavior. Thus, in this example of physical abuse, it can be argued that child abuse emerges when this *tendency* to use physical discipline results in a harmful act of physical violence because of certain risk factors experienced by a parent (e.g., depression, substance abuse, poverty, domestic violence). Belsky (1993) suggests maternal depression as one such risk factor. Thus, it is critical to examine how maternal depression interplays with parenting in order to understand the etiology of child maltreatment. The next two sub-sections review the literature that explores the parenting exhibited by depressed mothers, followed by the examination of parenting by maltreating parents.

Parenting of depressed mothers. Considerable research attention has been paid to parenting exhibited by depressed parents, particularly mothers. The available evidence indicates that an experience of depressive symptoms can interfere with mothers' interactions with their children and how they raise their children (Dix & Meunier, 2009; Lovejoy et al., 2000). It is recognized that depressed mothers exhibit decreased ability to maintain positive affective exchanges and increased conflicts in their interactions with their children (Broth et al., 2004; Caughy et al., 2009; Dix et al., 2008). They often report lack of competence in their parenting skills, lack of interest in child care, and fear or thoughts of hurting their children (Jennings et al., 1999; NRC & IOM, 2009). Not only do they show lack of positive engagement with their children, but depressed mothers also exhibit negative parenting behaviors such as irritability, aggression towards their children, and intrusiveness, which suggests a varying expression of maladaptive parenting behaviors (Lyons-Ruth, Wolfe & Lyubchik, 2000; Mcfadden & Tamis-LeMonda, 2013).

Mothers suffering from depression are often limited in their knowledge of child development; for example, depressed mothers often have unrealistic expectations and negative impressions of their children's growth and behaviors (Cornish et al., 2006; Weissman et al., 2004). Such a negative thought process can limit a mother's ability to successfully bond with her child, which can be associated with an increased use of corporal punishment, hostile feelings towards her child, and result in an increased risk for child abuse and neglect (Choi et al., 2010; Chung et al., 2004; Murray, Fiori-Cowley, Hooper & Cooper, 1996; Zuckerman, Bauchner, Parker, & Cabral, 1990).

The experience of early maternal depression also sets a foundation for maladaptive parenting behaviors long term, including lack of preventative health care use, insecure attachments, and insensitivity (Conroy, Marks, Schacht, Davie & Moran, 2010; Zajicek-Farber, 2009). Mothers experiencing depression often follow unfavorable health care seeking behaviors for their infants, such as increased use of emergency care and decreased use of preventative services and child's well-visits (Minkovitz et al., 2005). McLearn et al. (2006) suggests that while current maternal depression is a stronger predictor of age appropriate parenting behaviors, early maternal depressive symptoms may have an enduring effect on parenting behaviors that were established early in their lives including nurturance and attachment. Given the criticality of early childrearing environment for children's development (National Scientific Council on the Developing Child, 2007; Shonkoff et al., 2009), an early intervention for these mothers who are experiencing early maternal depression becomes necessary.

Such toxic effects of maternal depression on parenting are also evident among adolescent mothers. Similar to depressed adult mothers, young depressed mothers are less responsive to children's needs during the first year postpartum and such negative interactions with their

children happen more frequently than do positive interactions (Field et al., 2000; Lanzi et al., 2009). Studies also have shown that young depressed mothers often continue to be neglectful, hostile, and rejecting of their children beyond the first year postpartum and such behaviors are more frequently exhibited by the youngest married mothers with less than a high school education (Cassidy et al., 1996; Colletta, 1983). Luster (1998) also found that young mothers who were depressed at six, 12, and 36 months were perceived by their support workers as less supportive and insensitive at 54 months. Bates, Luster, and Vandenbelt (2002) examined similar relations and confirmed that early maternal depression did predict insensitive parenting at 54 months, after controlling for the concurrent maternal depression at 54 months.

When an adolescent mother experiences depression at early stages of her child's development, she may be unable to build suitable parenting skills. An adolescent mother often lacks the cognitive maturity to take on her parental role, which limits the capacity to obtain effective parenting skills in general (O'Callaghan et al., 1999). In addition, a young mother who suffers personal adjustment issues may not be prepared to parent because she cannot focus on meeting her child's developmental needs due to her own personal needs (O'Callaghan et al., 1999). When a young mother is depressed and experiences these parenting insecurities and lack of childrearing skills, her child may develop relationship building strategies that are dysfunctional (Tronick, 2006). Because of the already established interactive styles and parental challenges, a mother and a child may be unable to establish effective interactions later on, perpetuating their dysfunctional interactive styles and possibly leading to child abuse and neglect.

The increased concern for the detrimental impact of early maternal depression on young mothers' parenting is further evidenced in the literature on prenatal depression. Prenatal

depression is often considered a strong predictor of postpartum depression and compromises with their parental functioning (Deave et al., 2008; Gavin, Lindhorst, & Lohr, 2011; Goldstein, Diener, & Mangelsdorf, 1996; Meltzer-Brody et al., 2013; McLearn et al., 2006; Milgrom et al., 2009; Robertson et al., 2004). Women who experience depression during pregnancy face birth complications such as placental abnormalities, preeclampsia, and preterm births (Dayan et al., 2006; Field, Diego, & Hernandez-Reif, 2006; Li, Liu, & Odouli, 2009). Furthermore, children of mothers who experienced depression prenatally often require intensive care at birth and face numerous developmental complications such as slow fetal growth (Diego et al., 2009), low birth weight (Kim et al., 2013; Schetter & Tanner, 2012), cognitive, social, and behavioral challenges (Davis et al., 2007; Luoma et al., 2008; O'Connor, Monk, & Fitelson, 2013), and developmental delays (Deave et al., 2008; Pacheco & Figueiredo, 2012). Prenatal depression even affects infants' neurological and brain development, compromising their stress regulatory functioning (Field et al., 2006; O'Connor et al., 2013). Given that dysregulation of stress may hinder infants' ability to interact with their mothers effectively, the development of optimal reciprocal interaction may be compromised, further highlighting the importance of early intervention for supporting young mothers who are experiencing maternal depression.

Parenting exhibited by maltreating parents. A significant link also exists between parenting behaviors and child maltreatment. Parents who are involved in the child welfare system often lack the knowledge of child development and are unable to provide consistent and nurturing care (Azar, 2002; Howe, Dooley, & Hinings, 2000). Mothers who maltreat their children often have negative views of their children, are unable to bond with their children, tend to have anger issues, and engage in disciplining practices that are intrusive and harmful (e.g., spanking, shouting, physical restraints) (Choi et al., 2010; Hien et al., 2010; Munz et al., 2010;

Rodriguez, 2010). Furthermore, use of corporal punishment is found to increase the risk of physical abuse, suggesting that engaging in such disciplining acts can result in physically abusive parenting behaviors (Gershoff, 2002). Mothers who engage in neglectful parenting also show similar challenges in their parenting; in general, they are less empathetic, unable to provide basic care (e.g., clean housing), less proficient in managing their stress, and lack supervision skills (Shahar, 2001; Slack, Holl, McDaniel, Yoo & Bolger, 2004). Research on parenting programs for maltreating parents also revealed that maltreating mothers showed improved parent-child interactions and lower recidivism rate of involvement with the child welfare system after receiving the program services, suggesting that improvement in parenting can minimize the re-occurrence of child maltreatment (Chaffin, Funderburk, Bard, Valle, & Gurwitch, 2011; Gershater-Molko, Lutzker, & Wesch, 2002; Harder, 2005).

It is evident from the existing studies that maternal depression diminishes a mother's ability to provide nurture and care, and such maladaptive behaviors are exhibited by a maltreating parent. However, the extent to which such parenting issues occur among depressed mothers is not consistently documented. For instance, Sidor, Kunz, Schweyer, Eickhorst, and Cierpka (2011) did not find any relations between maternal depression and maternal sensitivity, control or unresponsiveness when the child was 19 weeks. Pelaez et al. (2008) found that although young depressed mothers were more authoritarian and disengaged than young non-depressed mothers during a child's toddlerhood, both groups of mothers spent most of their time being authoritative. In fact, Easterbrooks and colleagues (2005, 2010) found that high functioning teen mothers who were sensitive to their children's needs or did not perpetrate any child maltreatment during their children's first three years tended to be depressed. These findings suggest that although young depressed mothers may be at risk for multiple parental

issues including child maltreatment, they are actually capable of being resilient and becoming responsive and warm parents in the presence of their depressive symptoms.

To explain such variability in the documented impacts of maternal depression, considerable theoretical and research attention has been paid to the role of multiple contributing factors relevant to maternal depression, adolescent parenting, and child maltreatment (Belsky, 1984; 1993; Bronfenbrenner & Morris; 2006; Cicchetti & Toth, 1995). Given the multi-faceted nature of depression, differences in the experience in depressive symptoms among adolescent mothers may, in part, play a role in such inconsistent performance by adolescent mothers. The focus has also been strong on mothers' strengths, or the presence of protective factors, that may mitigate the negative impact of risk factors such as maternal depression. Furthermore, the importance of early intervention has been highlighted repeatedly across studies. With protective factors promoting positive parenting in the earlier years, prevention of child maltreatment may be more feasible by preventing the use of inadequate parenting altogether. Thus, in the following section, I shift focus to the resilience of young depressed mothers and examine relevant *protective factors* – *maternal mentalization, mother-father relationship, home visitation program utilization* – that promote positive parenting in the earlier years in the presence of maternal depression, which may operate as a precursor to the elimination of child maltreatment.

Protective factors in the presence of maternal depression. Resilience is a “dynamic process that leads to positive adaptation within the context of significant adversity” (Werner, 2005, p. 4). Such positive adaptation is considered a product of the balance between *risk* and *protective* factors that are present at multiple levels of ecology (Cicchetti & Toth, 1995; Luthar, Cicchetti & Becker, 2000). In the context of child maltreatment, risk factors make a mother vulnerable to perpetrating abuse and neglect and increase the likelihood of such harmful acts

occurring (Cicchetti & Toth, 1995). Protective factors, on the other hand, decrease the risk of child maltreatment by mitigating the impact of risk factors on a mother (Cicchetti & Toth, 1995).

Maternal depression is one of the risk factors that potentiate child maltreatment. However, the available evidence documents that some depressed mothers are indeed capable of providing positive parenting. Therefore, what distinguishes between depressed mothers who maltreat their children and those who do not may be the presence of certain protective factors that mitigate the effect of depressive symptoms from influencing their parenting behaviors. Such protective factors are present at multiple levels, and individual dispositions and sources of support are particularly salient in the promotion of resilience.

The effect of protective factors can be expected to occur in two ways. First, the presence of protective factors may *reduce* the impact of risk factors including stress and negative attitudes about parenting. Among depressed mothers, distorted views of their children as well as of themselves as parents are common (Ammaniti, Tambelli & Odorisio, 2013; Cornish et al., 2006; Weissman et al., 2004). They often exhibit lower confidence and satisfaction in their parenting, and experience parenting stress, particularly about how difficult their children are (Colletta, 1983; Panzarine et al., 1995; Whitson et al., 2011). These self-perceptions as incompetent parents continue to impact their view as their children age, possibly interfering with the development of healthy parent-child relationships (Luster, 1998; Ramos-Marcuse et al., 2010). The presence of protective factors can reduce these risk factors, preventing parental behaviors from being influenced by these risk factors.

The buffering effect also may occur when compensatory effects of protective factors *outweigh* the effects of risk factors. For instance, while the use of physical disciplining practice often accompanies a higher acceptance of physical discipline (Rodriguez, Russa & Harmon,

2011), some studies do show that abusive mothers do not necessarily favor the idea of corporal punishment (Mennen & Trickett, 2011). Therefore, although a mother may know what is appropriate for her child, she could resort to maladaptive parenting behaviors due to the cumulating challenges and limited resources. Studies on neglectful mothers also support this process, where neglect is linked to the presence of multiple risk factors such as family stress, social isolation, and limited knowledge of age appropriate childrearing practices (Dunn et al., 2002). According to a developmental psychopathology perspective, an individual's development and behavior are determined by the interplay of risk and protective factors that exist within multiple contexts (Cicchetti & Toth, 1995). The presence of cumulative risks, rather than one risk factor, is thought to trigger the onset of child maltreatment (Begle et al., 2010; Nair et al., 2003). Thus, it is plausible that when more risk factors are present, a mother is unable to overcome the stress of these risks, resulting in unfavorable parenting, whereas the presence of more protective factors can lead a mother towards more favorable parental functioning, reducing the risk of poor parenting and child maltreatment.

Unfortunately, there is little information on resilience among adolescent mothers because adolescent mothers are often generalized and perceived as an at-risk population for maternal depression and poor parenting. However, evidence exists that young depressed mothers can show resilient functioning in parenting despite their emotional issues, emphasizing the importance of examining protective factors that promote positive parenting among these young mothers (Chaudhuri, Easterbrooks, & Davis, 2009; Easterbrooks et al., 2010). So which protective factors play a role in young mothers' resilient functioning in the presence of their depressive symptoms? Young mothers' resilience seems to come from their own strengths as well as from environmental protective factors such as social support and resources. In particular,

recent research on cognitive maturity focuses on maternal mentalization, a mother's cognitive ability to recognize her child's mind (Meins, 1997; Slade, 2005). That is, when a mother is competent in identifying and understanding correctly her child's intentionality of behaviors and her child's internal state, she is able to separate and regulate her own emotions, focus on her child's state, and thus be able to develop effective interactions with her child.

Social support also is considered consistently, both theoretically and empirically, as a critical component of young mothers' resources that alleviates the likelihood of maternal depression and child maltreatment and promotes positive parenting and child development during times of stress (Ceballo & McLoyd, 2002; Haglund, Nestadt, Cooper, Southwick & Charney, 2007; Logsdon, Birkimer, Simpson & Looney, 2011; Lyons, Henly, & Schuerman, 2005). Such support can be provided from an informal source, such as family members, spouse/partner, and friends, as well as from formal sources, including public prevention and intervention services such as home visitation programs. Given the importance of romantic relationships during adolescence (Collins, 2003), a romantic partner or the father of the child may become a significant support for a young mother's well-being. Furthermore, given the current limited effectiveness of home visitation programs in supporting young mothers who are clinically depressed, it will be imperative to further assess and analyze the contribution of home visitation programs in supporting young mothers with varying degrees of depression. The following sub-sections discuss the protective role of maternal mentalization, mother-father relationship, and home visitation programs that are deemed particularly relevant and understudied in relation to maternal depression, adolescent parenting, and child maltreatment.

Maternal mentalization: Mind-mindedness. Among qualities of parents' cognitive functioning, recent research has shed light on a mother's mentalization of her parental

experiences, specifically her reflection, thought processes, cognitions, and verbal accounts of her experiences with her child, as a critical aspect of her cognitive ability that may influence parental behaviors and child outcomes (Fonagy, et al., 1991; Meins, 1997; Slade, 2005; Slade et al., 1999). It is theorized that an adolescent mother's cognitive maturity to parent is a vital ingredient for effective parenting that is unique to adolescent parenthood (Afifi, 2007; Schellenbach et al., 1992); thus, the concept of maternal mentalization may be a relevant and critical dimension of cognitive functioning that may help us further understand the mechanism behind a young mother's behaviors and her impact on her child's developmental outcomes.

Maternal mentalization has been explored by several theoretical frameworks, from psychoanalytic points of view to a Vygotskyian framework (Sharp & Fonagy, 2007). I believe they all share an underlying definition of maternal mentalization as a parental capacity that recognizes a child as an individual psychological agent. It is a capacity not only to notice and acknowledge a child's inner state, but also to interpret it accurately and respond precisely to support the regulation of a child's emotions and behaviors (Meins, 1997; Sharp & Fonagy, 2007; Slade, 2005). At the same time, a parent who has the capacity to mentalize a child's inner state must also be skilled in understanding her own mental state in general as well as her own personal feelings of parenthood (Soderstrom & Skarderud, 2009). By recognizing both her own and her child's mental state, and accepting that they are both separate entities, a mother is then able to step aside emotionally and respond to her child's behaviors effectively (Meins, 1997; Sharp & Fonagy, 2007; Soderstrom & Skarderud, 2009). This suggests that a mother must not merely demonstrate her understanding of her child's inner state, but she must also communicate her understanding by verbally and behaviorally modeling appropriate ways of regulating and mastering emotions (Fonagy & Target, 1997; Grienenberger, Kelly & Slade, 2005). Seeing how

a mother recognizes her child's mental state and how she acts based on this recognition allows in-depth examination of a mother's inner strength (Slade, 2005). This process of translating her understanding into effective parenting behaviors may, however, be disrupted when a mother faces life challenges such as adolescent pregnancy and depression.

While several constructs have been explored and developed to operationalize maternal mentalization, Meins (1997), operating from a cognitive developmental point of view, coined the term "mind-mindedness" to explore such parental capacity to mentalize and reflect on parenting experiences. Earlier work on parental representation examined parents' reflection on their own childhood experiences, often using the Adult Attachment Interview (Sharp & Fonagy, 2007). While such an interview can elicit information that is helpful to understand a mother's attachment experiences with her own caregivers, the impact of a mother's own attachment experiences and her thought processes in relation to childrearing may be child specific and become more apparent in the context of a mother-child interaction (Sharp & Fonagy, 2007). Thus, to better assess the impact of maternal mentalization on a mother's behaviors and on a child's development, recent studies have focused on assessing maternal mentalization in the context of ongoing, current parent-child relationships (Aber, Belsky, Slade & Crnic, 1999). Mind-mindedness operationalizes maternal mentalization by coding both a mother's representations of her relationship with her child as well her actual observed behaviors during real-time interactions with her child (Meins, 1997; Sharp & Fonagy, 2007). Furthermore, mind-mindedness has shown good validity and reliability and yielded salient findings that tap into the importance of maternal mentalization for parenting and child development (Walker, Wheatcroft & Camic, 2011).

Mind-mindedness and parenting. Such a capacity to recognize a child's mental state has been empirically documented to predict parental behaviors (Sharp & Fonagy, 2007). For instance, studies that looked specifically at the link between mind-mindedness and parenting behaviors found that the use of mind-related comments was linked to both parental sensitivity and hostile behaviors (Lok & McMahon, 2006; McMahon & Meins, 2012). Mind-mindedness also is found to be important for infant attachment (Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2012), and it seems to be establishing its effect through impacting parenting behaviors. Lundy (2003) found that a parent's perspective-taking tendencies measured by mind-mindedness was linked to a greater synchrony between parents and their children during interactions at six months, which in turn predicted infants' attachment security at 13 months. Laranjo, Bernier and Meins (2008) further confirmed that mothers' mind-mindedness, particularly their ability to comment on their children's inner state, predicted maternal sensitive behaviors during their interactions with their children at 12-13 months postpartum, which in turn predicted infants' attachment security at 15-16 months postpartum. These findings confirm that for a mother to be an effective parent who responds and interacts with her child in a developmentally appropriate way, she must first recognize her child's cues by understanding her child's inner state (De Wolff & van IJzendoorn, 1997; Meins, 1999).

The research that examined maternal mentalization using different instruments also confirms a robust link between maternal mentalization and parenting. For instance, Grienberger et al. (2005) found that a low score on Parent Development Interview (PDI; Aber, Slade, Berger, Bresgi & Kaplan, 1985; Slade, Bernbach, Grienberger, Levy & Locker, 2004), an instrument that examined parents' reflective functioning or parents' ability to understand their children's behaviors, thoughts and feelings, was related to disrupted maternal behaviors during

the Strange Situation Procedure used to assess infant attachment. Mothers who were enrolled in a mentalization-based intervention that promoted reflective functioning also displayed improved use of preventative care and better parent-child interactions (Sadler et al., 2013). Mothers' reflective functioning also was associated with children's attachment security, attention, withdrawal, social skills, and adaptability to parenting distress, and parents' poor reflection of their children was related to poor child development, including behavioral regulatory issues (Dollberg, Feldman & Keren, 2010; Slade, Grienenberger, Bernbach, Levy & Locker, 2005). For depressed mothers, reflective functioning was particularly critical in promoting positive parenting (Trapolini, Ungerer, & McMahon, 2008). Given the significant link found between maternal mentalization, parenting and child development in above studies, this overarching construct of maternal mentalization can be considered a critical factor in determining parental and child outcomes.

With adolescent mothers, however, our understanding of the link between maternal mentalization and parenting behaviors is restricted due to a very limited number of studies examining maternal mentalization for this population. Only one study of adolescent mothers was identified, comparing the use of mind-minded comments among adult and adolescent mothers and whether it was related to their sensitivity toward their children (Demers, Bernier, Tarabulsky, & Provost, 2010). Interestingly, the study findings pose a question about the relevance of maternal mentalization for adolescent mothers. While the study found use of almost no positive comments among adolescent mothers, and over 10% of their comments during the interactions were negative, the authors only found marginal associations between mindful comments on infants' mental state and young mothers' sensitivity toward their children. A significant relation was only found between maternal sensitivity and mothers' use of comments on infants' attempts

to manipulate other peoples' thoughts (e.g., "You are kidding me!"), which took on negative valence. This lack of significant findings may suggest that the benefit of mind-mindedness seen in adult mothers may be less relevant for young mothers. On the other hand, because adolescent mothers in general seem to be very limited in the use of mindful comments, with positive comments being almost non-existent, the benefit of positive mindful comments may actually be exponential among this population, if they actually do acquire the skill to use these comments. Considering that no other study has evaluated mind-mindedness with this particular population, further investigation becomes necessary to further confirm if maternal mentalization is truly a relevant concept for young mothers to acquire, and this dissertation gave us an opportunity to witness just that.

Mind-mindedness and maternal depression. Depressed mothers often have distorted views of their children as well as of themselves as parents (Ammaniti et al., 2013; Cornish et al., 2006; Weissman et al., 2004). Thus, it is intuitive to think that maternal depression can impact mothers' capacity to mentalize about their children's inner state. Empirical evidence is, however, mixed and also limited; while studies found a link between maternal depression and mothers' infrequent use of mind related comments (Lok & McMahon, 2006; Pawlby et al., 2010), another study did not find such a link among mothers of young children (Walker et al., 2011). Moreover, while maternal mentalization showed relative stability across time (Aber et al., 1999; Arnott & Meins, 2008; Meins, Fernyhough, Arnott, Turner & Leekam, 2011), it was susceptible to intervention effects (Colonnese et al., 2012; Pajulo et al., 2012; Sadler et al., 2013; Schechter et al., 2006; Stirtzinger et al., 2002). Given the limited amount of study regarding mind-mindedness and its relation to maternal depression, and considering the enduring, but ambiguous effects of maternal depression on mothers' functioning, further examination of the

relation between maternal depression, mind-mindedness and maternal behaviors will further clarify the protective nature of maternal mentalization for mothers experiencing depression at different rates.

Given that teenage mothers are often less cognitively prepared for parenting and have inappropriate expectations of their children (Miller, Miceli, Whitman, & Borkowski, 1996; Mylod, Whitman & Borkowski, 1997; Sommer et al., 1993; Tamis-LeMonda, Shannon & Spellmann, 2002), we may speculate that their experience of depression may have a more profound impact on their ability to relate to their children, as it may become an additional risk factor that compromises their parenting. Unfortunately, we are even less knowledgeable about maternal mentalization among young depressed mothers, because no study has investigated this particular population. This is a gap that requires a further examination of how maternal depression may impact young depressed mothers' capacity to relate to their infants' mental state.

Mother-father relationship. Considering the critical nature of romantic relationships during adolescence, it is evident that a young mother's partner is a significant contributor to her functioning as well as to her child's development. Studies do, in fact, show a relatively strong impact of partner relationships on maternal depression, parenting, and child outcomes (Beers & Hollo, 2009; Bunting & McAuley, 2004; Cerniglia, Cimino & Ballarotto, 2014; Gavin et al., 2011; Huang & Lee, 2008; McDowell & Parke, 2005). In this dissertation, partner relationship is considered a construct that represents the aspect of positive support that partner relationships can provide, and whether it functions as a protective factor may depend on the quality of partner relationships, types of support provided by the partner, and when the support was provided in relation to the mother's parenting status⁴. It is important to note here that, while many of the

⁴ Partner relationship in this dissertation refers to the relationship with the father of the baby.

studies done on partner relationships are correlational, several theoretical perspectives on maternal depression and parenting suggest that it is more plausible to consider partner relationship as a vehicle that promote early positive parenting and healthy maternal mental health (Afifi, 2007; Belsky, 1993).

Partner relationship and maternal depression. It is important to first understand the impact of partner relationships on young mothers' psychological functioning. It is reported that the support from male partners can improve the psychological functioning of young mothers (Bunting & McAuley, 2004). For instance, Stevenson, Maton, and Teti (1999) found that when support from the father of the baby was available, young mothers were more likely to have a higher self-esteem and fewer depressive symptoms. Contreras and others (1999) similarly found that young mothers who lived with the fathers of their babies exhibited lower depressive symptomatology when they reported higher level of support from the fathers.

While the availability of partner support may be critical, the mere presence of the partner is sometimes not enough. First of all, the partners that these young mothers choose are often limited in their own social and economic resources themselves, so living with them can create an additional burden on young mothers (Colletta, 1983; Nadeem, Whaley, Anthony, 2006). Moreover, adolescent mothers often do not remain in relationships with the fathers of their babies; Edwards et al. (2012) found that less than half of the mothers in the study were in a relationship with the fathers of their babies by two years postpartum. Given that arguments and instability in their relationships have been identified as sources of stress for young mothers (Colletta, 1983), the support they receive in such unstable, conflictual relationships may not be helpful in alleviating their stress or their depression (Gee & Rhodes, 1999). If this is truly the case, what makes partner relationships helpful?

The presence of a partner becomes beneficial to a young mother's psychological functioning when she has a stable romantic relationship (Kalil & Kunz, 2002). In fact, a study by Edwards et al. (2012) on the impact of social support on depression among young mothers who differed in partner relationship status at third trimester of pregnancy, four, 14 and 24 months postpartum (e.g., in a relationship with the father of the baby, not in a relationship, and friends with father of the baby) found that the support from the partner was beneficial in decreasing mothers' depressive symptoms only when the mother and the father maintained their relationship, particularly during pregnancy. Leadbeater and Linares (1992) also revealed that fathers' support was only predictive of maternal depression at 12 months postpartum, and not at one month or at 28-36 months. This may be because adolescent relationships are often fluid and many of the mothers were involved with other male partners by 28-36 months. These findings suggest the importance of young mothers learning how to maintain healthy relationships with the fathers of their babies, especially during pregnancy and first year postpartum when young mothers are most vulnerable emotionally (Zelenko et al., 2001).

In addition to the mother's relationship status across time, the support that the partner provides has to match what the mother wants. Fagan and Lee (2010) found that high levels of young mothers' satisfaction with the fathers' involvement, rather than the actual perceived amount of their involvement, were related to fewer depressive symptoms through an increased sense of parenting competence. Quinlivan, Luehr, and Evans (2004) also found that the high satisfaction rate with the communication of their partners was correlated with young mothers' lower depression levels, and Gee and Rhodes (2008) found that social strain (e.g., disappointment, intrusiveness, disagreements) could increase young mothers' depressive symptoms. These findings suggest that how young mothers feel about their partners' support,

more than how much their partners are actually helping out, can impact their psychological functioning, either directly or through building confidence in mothers' ability to obtain the support they and their children need.

Many young females who become pregnant as teenagers are exposed to partner violence and maltreatment during their childhoods (Hillis et al., 2010; Miller, Benson, & Galbrith, 2001; Noll & Shenk, 2013; Smith, 1996). According to John Bowlby (1969), early experiences create a working model that becomes the basis of a child's later definition of self, the world, and the social relationships. Studies do show a significant impact of early attachment on later development, and those who had attachment complications as a child tend to exhibit relationship problems and limited social skills (Malekpour, 2007; Sroufe, 2005). Thus, for a young mother who was exposed to such violence and inadequate parenting, maintaining a supportive relationship with the father of the baby may reduce the impact of other preexisting risk factors on their mental health functioning.

Partner relationship and parenting. A partner relationship can also exert its effect on young mothers' parenting behaviors. Adolescence is a period when teens are particularly insecure about who they are, and adolescent parenthood can exacerbate such insecurity as they may become more distant from their peers in order to juggle their dual responsibility as a teenager and a parent (DeVito, 2010; Erikson, 1963). Therefore, positive partner relationships that can alleviate such insecurity may be critical in promoting positive parenting among young mothers. In fact, the impact of good partner relationships on parenting behaviors was much stronger for young mothers than it was for adult mothers (Huang & Lee, 2008), which further emphasizes the significance of a positive partner relationship for young mothers. Studies also found that positive support from the father of the baby as well as from mothers' current partners

promoted mothers' life satisfaction and their ability to provide a nurturing environment for their children (Brunelli, Wasserman, Rauh, Alvarado & Caballo, 1995; Samuels, Stockdale, & Crase, 1994; Unger & Wandersman, 1988). Not only did the support of the father matter, but the actual amount of hours he spent with the baby was also critical, where the more time the father spent with his baby was related to more positive childrearing attitudes and less life stress among young mothers (Seymore, Frothingham, Macmillan & Durant, 1990). Considering such significant contributions, cultivating positive partner relationships and support may be critical for young mothers whose relationships with their children is impacted by their partner relationships.

While partner support seems to show a positive impact on a young mother's parenting, some studies show it to be a negative influence. Kalil, Ziol-Guest, and Coley (2005) found that the involvement of the father of the baby was related to an increase in maternal stress, while Leadbeater and Way (2001) found an increased amount of conflict among the parents when the father became involved in childrearing. The support from the father of the baby also predicted a lower parenting competence and parenting satisfaction (Colletta, 1983; Shapiro & Mangelsdorf, 1993). Teenagers often long for attention, so the involvement of the father of the baby may potentially divert her attention from her parental role, possibly competing with her baby for the attention from the father. This suggests the importance of helping mothers understand what healthy partner relationships entail in relation to their well-being as well as to their children's development.

The negative impact of a father's involvement could also stem from the poor quality of a mother-father relationship. Studies showed that the maintenance of a positive partner relationship was critical in promoting a young mother's healthy parenting (Brunelli et al., 1995; Samuels et al., 1994; Unger & Wandersman, 1988), and continuous involvement of the father of

the baby predicted a better home environment, continuous custody, and fewer reports of injuries and abuse/neglect investigations (Curtona, Hessling, Bacon & Russel, 1998). However, Contreras (2004) found that the impact of the father of the baby varied depending on the residence status of the parents. Childcare assistance from the father of the baby increased positive behaviors during mother-child play for both mothers who did and did not live with the fathers of the babies, but more strongly for those who did not. On the other hand, partners' social and emotional support predicted poorer parenting when mothers did not live with the fathers, but better parenting outcomes when mothers lived with the fathers of their babies. These findings suggest that while any physical assistance in caring for the child may be helpful, perhaps by alleviating the daily tasks that a mother has to accomplish and allowing her to be more available to spend time with her child, a mother may resent the father of the baby's contribution through emotional support and cognitive guidance if she and the father are no longer engaged romantically.

Relevant to these findings, Colletta (1983) found that young mothers who were married showed lower parental confidence and competence than young single mothers. Given that a young married mother often lives alone with her husband, who is often a teenager himself, she may be limited in and isolated from her social network that supports her with childcare and parenting. While maintaining the relationship with the father of the baby may be beneficial if it is on good terms and assists by reducing a young mother's childcare obligations as a parent, it can also become a source of stress for her if her relationship with the father of the baby is hostile and lacks the needed support, impacting her interactions with her child. These findings further suggest the importance of partner relationship quality for the well-being of a young mother, and for her interaction with her child.

The effects of partner relationships on young depressed mothers' functioning.

Unfortunately, no studies have examined the role of partner relationship on young mothers' parenting functioning in the presence of maternal depression. This gap is particularly crucial to explore, as young mothers are more vulnerable to maternal depression and poor parenting. There are a few studies, however, that examined the effect of partner relationships on adult depressed mothers' functioning that may serve as the basis for research on partner relationship and adolescent parenthood in the presence of maternal depression.

The findings of studies point to a buffering effect of social support for mothers who experienced depression (Gustafsson & Cox, 2012; Lyons et al., 2005; Martin, Gardner & Brooks-Gunn, 2011); that is, social support may protect against poor parenting by reducing the impact of maternal depression. Using the absence of inter-partner violence as a proxy for the presence of support, Gustafsson and Cox (2012) found that partner support reduced maternal depression, which in turn reduced harsh parenting behaviors. Lyons et al. (2005) examined the moderating role of support (including family, friends, and partner), and found that maternal depression was linked to less use of positive parenting only for mothers with low levels of support; depressive symptoms among mothers who had high levels of support did not impact their use of positive parenting behaviors. These findings suggest that the presence of social support plays a crucial role in promoting positive parenting behaviors, either by reducing the depressive symptoms or by helping depressed mothers better cope with their symptoms. Unfortunately, these studies have not examined the unique contribution of positive partner support as opposed to family members and friends. Given the importance of romantic relationships for adolescent females, the examination of the partner relationship and its effect on parenting among young mothers in the presence of maternal depression is warranted.

Furthermore, the variability in the experiences of maternal depression also questions whether positive partner relationship may be more beneficial for mothers with greater risks (e.g., chronic maternal depression).

The quality of partner support also is particularly crucial when understanding the effect of a partner relationship on depressed mothers' functioning. For instance, while Lyons et al. (2005) found that mothers with more support fared well such amount of support did not impact their use of positive parenting, they unexpectedly found that maternal depression predicted an increased use of *negative* parenting when mothers had high levels of support. Although this study did not specifically look at partner support, its findings suggest that the effectiveness of partner support in improving a mother's parental functioning may largely depend on the characteristics and capabilities of the partner who steps in to support (Lyons et al., 2005). When support is given, but this support is not particularly helpful in assisting a depressed mother become a "better" parent, its presence may divert her attention from her parental role or become a source of a maladaptive drive for maladaptive parenting behaviors. Thus, the nature of partner relationships becomes crucial, especially when a depressed mother is trying to be a better parent by coping with her symptoms. Again, the investigation of partner relationship needs to be executed to decipher its role in young mothers' parenting in the context of her mental health challenges.

Home visitation program. Home visitation is a service delivery approach that aims to promote maternal and child well-being (US DHHS, 2010). Home visitation often is provided to families beginning prenatally and continuing until the child enters kindergarten; it typically includes regular, one-on-one visits by nurses or paraprofessionals (US DHHS, 2010). During the visits, parents are provided with information, psychoeducational training, referrals to community

resources, and case management services that assist their parenting and their children's growth (Astuto & Allen, 2009). Although multiple models exist in how home visiting programs are implemented, there is consensus that home visitation is a staple of early prevention and intervention for families and children (Guterman, 2001). As a show of the public's increasing confidence in home visiting, the Obama administration enacted legislation called the Patient Protection and Affordable Care Act in 2010 that provided \$1.5 billion over five years to promote the provision of evidence-based home visitation programs to families and children (US DHHS, 2010). In 2013, an additional \$69.7 million was budgeted towards an enhancement and expansion of the evidence-based home visitation implementation across the states (US DHHS, 2013, September 6). It was estimated that about half a million children are receiving home visitation each year (Astuto & Allen, 2009; Gomby, 2005), and recent national statistics suggested that in 2011, about 14% of children from birth to three in the U.S. were served by home visitation programs for new parents (Kid Count, 2012).

Unfortunately, the empirical findings on the effects of home visitation on parenting and child development are mixed; while some studies report a reduction in child maltreatment incidents and positive long term effects among at risk mothers, others report the effects to be only modest and insufficient in preventing child abuse and neglect (Chaffin & Friedrich, 2004; Duggan et al., 2007; Eckenrode et al., 2000; Howard & Brooks-Gunn, 2009; Olds et al., 2007; Stevens-Simon, Nelligan, Kelly, 2001; Shaw, Levitt, Wong, Kaczorowski, & The McMaster University Postpartum Research Group, 2006). Some authors suggest that the effects of home visitation may be short lived (Cherniss & Herzog, 1996; Fraser, Armstrong, Morris & Dadds, 2000) and not effective for those who have the greatest risk for dysfunctional parenting (Caldera et al., 2007; Duggan et al., 2007). The opaque nature of these empirical findings emphasize the

need to examine factors that facilitate or undermine the benefits of home visitation and what population benefits the most from receiving this service (Duggan et al., 2007; Howard & Brooks-Gunn, 2009). The following subsections discuss the effects of home visitation among depressed mothers and adolescent mothers, examining the aspects of home visitation programs that may further explain the contradicting empirical findings.

Home visitation and maternal depression. Among the challenges that have been identified as obstacles in producing positive effects of home visitation, maternal depression has been considered the most prevalent and common challenge in the provision of home visitation (Ammerman et al., 2010; Boris et al., 2006; Jacobs et al., 2005; Tandon et al., 2005). Studies that looked at different home visitation programs showed that 30 to 57% of participating mothers exhibited depressive symptoms in the clinical range at program enrollment (Ammerman et al., 2009, 2010; Stevens, Ammerman, Putnam, & Van Ginkel, 2002). A portion of mothers also continued to express clinical levels of maternal depression while they were enrolled in home visitation services (Ammerman et al. 2009; Chazan-Cohen et al., 2007; Duggan et al., 2007). An examination of adolescent mothers in home visitation program also revealed that close half of the mothers still exhibited depressive symptoms at clinical level by the end of program evaluation, and 27% of mothers were chronically depressed during program enrollment (Jacobs et al., 2005). Comparative studies between home visitation and control groups often show no group differences in the level of depression (Duggan et al., 2004, 2007; Mitchell-Herzfeld, Izzo, Greene, Lee & Lowenfels, 2005), but some do show some differences between the two groups, where the control group showing higher depression level than the group receiving home visitation (Duggan, Berlin, Cassidy, Burrell & Tandon, 2009; Easterbrooks et al., 2013; Tandon, Perry, Mendelson, Kemp, & Leis, 2011).

Despite many home visiting programs having protocols in place for referring families who are facing mental health challenges to community resources, they often struggle to identify and address challenges related to depression (Duggan et al., 2004). Home visitors reported maternal mental health problems as a significant barrier in their work, with depressed mothers being difficult to engage during home visits and depression preventing them from providing consistent services (Stevens, Ammerman, Putnam, Gannon & Van Ginkel, 2005). Many home visitors also reported that although they face mental health problems frequently in their work, they felt that they were inadequately trained in serving families with such challenges (Tandon et al., 2005). Furthermore, mothers infrequently seek treatment, with a study reporting that only 12% of depressed mothers who participated in home visitation received treatment in the first year of service after being referred to mental health services (Ammerman, Putnam, Stevens & Holleb, 2003 cited in Ammerman et al., 2005). In particular, poor, depressed mothers were less likely to receive treatment for their depression than were those with higher incomes (Lennon, Blome, & English, 2001), suggesting that with multiple risk factors present and to be addressed, home visiting programs are unable to adequately assist in the alleviation of maternal depression and promote the use of mental health services among families they are serving.

Such lack of success in addressing depression often undermines the potential benefits of participating in home visitations (Ammerman et al., 2010). Among families who receive home visitations, depressed mothers showed higher parental stress, less appropriate and nurturing home environment, and less connection with their support network than non-depressed participants (Ammerman et al., 2012). Easterbrooks et al. (2013) recently reported that young depressed mothers who received home visitation had more substantiated reports of child abuse and neglect than did non-depressed mothers who received home visitation. While multiple

models of home visitation exist and implementation varies considerably across models and sites, home visitation programs all share the notion that by influencing parents, a program can prevent harmful acts toward children, which in turn can lead to a better child outcome. Unfortunately, maternal depression often prevents this first critical step of influencing parents. However, studies often do not take into account the multidimensionality (e.g., chronicity, severity) of maternal depression, limiting our understanding of how the presence of maternal depression is actually impeding with the benefits of home visitation. As Duggan et al. (2007) suggested, a home visitation program, even with a high dosage of use, may not be effective with families who are very high risk and face significant challenges. Thus, perhaps mothers who are facing chronic and severe forms of depression may not respond well to the services (Ammerman et al., 2009, 2010), or mothers who are hovering around the clinical range of depressive symptoms may be the ones who are not benefiting from the services because home visitors are unable to detect these near-clinical depressive symptoms and refer them to appropriate services in a timely manner. Thus, we need to further investigate which particular families with maternal depression may be susceptible to this attenuation of program effects and which people may benefit the most from the program.

Home visitation and adolescent parenthood. Several studies have demonstrated that home visitation is most effective for first-time teenage mothers (DuMont et al., 2010; Howard & Brooks-Gunn, 2009; Middlemiss & McGuigan, 2005). Given the increased risk of poor parenting and child maltreatment among young mothers, this is encouraging. Barnett and colleagues (2007) found that home visitation improved young mothers' parenting attitudes and school continuation. Barlow et al. (2013) who examined the home visitation program effect for American Indian teen parents also found positive impacts of home visitation; young mothers

who received home visitations showed greater parenting knowledge and higher self-efficacy as parents at 12 months postpartum, suggesting that receiving home visitation not only increases the level of knowledge, but also boosts young parents' confidence in their parenting. There also is evidence that suggests a decreased number of non-birth related hospitalization, adverse perinatal outcomes, repeated pregnancies, and less use of marijuana among participants receiving home visitation (Koniak-Griffin et al., 2003; Nguyen, Carson, Parris, & Place, 2003). Comparative studies that examined the effects of home visitation among teen and adult mothers also suggested promising effects of home visitation for young mothers; young mothers showed deficits in the knowledge and skills in parenting at program enrollment, but showed significant improvements in their knowledge of infant development and their parenting skills post-enrollment, such that their level of knowledge and skills were no longer different from that of adult mothers (Culp, Culp, Blankmeyer & Passmark, 1998; Hammond-Ratzlaff & Fulton, 2001).

While these studies found a promising effect of home visitation, there are contradicting findings as well. Stevens-Simon et al. (2001a) found no group differences in the pattern of health care utilization, the rate of postpartum school return, the rate of repeated pregnancies, or in the rate of child maltreatment among young mothers. Wagner and Clayton (1999) did find positive effects of home visitation on young mothers' knowledge of child development and their interaction with their children, but such effects were modest. Finally, Barnett et al. (2007) found improved parenting attitudes and educational attainment among participating adolescent mothers, but home visitation did not show any effect on reducing repeat pregnancy, maternal depression, or in increasing the use of primary care. Given the limited effects of home visitation on maternal depression and inconsistent effects on adolescent parenting, a further look in the ways home

visitation programs are utilized could shed light in how programs can increase their effectiveness with these difficult populations.

Home visitation program utilization. There is significant variability in the ways home visitation programs are modeled and implemented. However, they generally share six common elements: 1) early enrollment (preferably prenatally), 2) early engagement of mothers, 3) strengthening of families' protective factors and mitigation of risk factors, 4) use of multiple strategies and resources, 5) frequent contacts, and 6) extended duration of program enrollment to ensure successful transition (Ammerman et al., 2010). These elements are implemented and utilized differently among programs based on family strengths and needs, and the available evidence suggests that participants' improvement following program enrollment may depend on how these program elements are implemented and utilized (Astuto & Allen, 2009; Olds & Kitzman, 1993). For instance, Honig and Morin (2001) found that high risk adolescent mothers showed lower rates of child abuse and neglect when they were enrolled before their children's birth. The early program enrollment may also be key in intervening with maternal depression among young mothers since depression is often chronic and recurrent (Ammerman et al., 2009; Burcusa & Iacono, 2007; NRC & IOM, 2009). Eckenrode et al. (2000) found that mothers who were enrolled in the home visitation program during pregnancy and postpartum showed more improvements in their parenting knowledge and skills than those who only had contact with the program during pregnancy, suggesting that the duration of the program participation, particularly at a time of major transition (e.g., being pregnant to being a mother), may make a difference in the effects of the program and reduce the occurrence of depression among pregnant young mothers. Mothers who had frequent contacts with their home visitors were also shown to do

better, with at least three visits a month being the threshold of showing program effects (Nievar, Van Egeren & Pollard, 2010; Wagner & Clayton, 1999).

However, we must be cautious about concluding that more visits are better and consider the characteristics of the participants, as a recent meta-analysis showed that mothers who have significantly high risks for dysfunctional parenting may not show any improvements in the rate of child maltreatment, even with a high dosage of home visitations (Howard & Brooks-Gunn, 2009). As Sweet and Appelbaum (2004) suggested, no one program characteristic does the trick in improving parental and child outcomes. Therefore, it is critical to examine the effect of program in depth by investigating what aspects of the home visitation program utilization are influential and for what particular population, especially in relation to varying experiences of maternal depression.

Methodological Considerations

Several methodological challenges of the studies should be noted. First, the measures used to identify child maltreatment are variable across studies. While some studies use measures that assess the *risk* for child maltreatment by assessing mothers' perception on maltreating or maladaptive parenting behaviors, other studies use the actual reports of child maltreatment. Being "at risk" and having the actual "records" of maltreatment may hold different meaning for the child maltreatment construct, which can make the interpretations of the findings less conclusive. Moreover, the types of maltreatment are often not taken into account in the analyses, and the allegation decisions of whether reports are substantiated or not are often not mentioned in the studies, which makes the interpretation of the studies less precise. The current study used the actual records of maltreatment reports, which may be a more concrete representation of child abuse and neglect, and incorporated both substantiated and unsubstantiated reports to address

underrepresentation of child abuse and neglect. The type of maltreatment reports were not considered as the majority of reports were of neglect among this study sample.

The parenting construct is also measured using different definitions and measures. For instance, the parenting construct can be represented by self-reported attitudes about parenting, or it could be defined as knowledge of childrearing or actual observed parenting behaviors such as sensitivity, responsiveness, and disciplining behaviors. Thus, these multiple dimensions of parenting that can be examined can create difficulty in comparing results and making interpretation across studies. The current study focused on emotional availability that captures parental sensitivity and patience to define parenting.

Relevant to this issue is the varying definitions of maternal depression. Maternal depression is often measured either by using a diagnostic tool or a screening tool. A diagnostic tool determines the clinical level of maternal depression based on the standardized criteria including DSM-IV, which indicates the presence of maternal depression when certain sets of symptoms are present for more than two weeks. On the other hand, a screening tool often determines the level of maternal depression by asking whether the symptoms identified in the tool are present during the past week. These two types of tools can yield a similar categorization of maternal depression (clinical or non-clinical), but based on different margins or threshold of criteria, contributing to the inconsistent analysis findings. Maternal depression is prevalent among adolescent mothers. Thus, being at risk for depression may already be detrimental enough to impact their parenting; therefore, the current study examined depressive symptoms measured by a screening tool.

The analysis design of the studies are also variable, particularly when studies are longitudinal. Some studies examine the longitudinal relation between maternal depression and

selected outcomes by looking at maternal depression at each time point (e.g., how maternal depression at time 1 and time 2 each linked to parenting at T3). The findings of studies using this method yield answers to research questions such as whether early or concurrent maternal depression is linked to parenting later on. Other studies may look at the *change or patterns* in maternal depression in relation to selected outcomes, and examine whether improvement or worsening of depressive symptoms across time can impact parenting. Although these studies are all looking at how maternal depression is associated with outcomes long term, the interpretation of the findings can vary considerably between the studies that use these two different analysis methods. While these variations in the analysis method can provide rich information on maternal depression, the synthesis of the findings across studies can vary. The current study focused on the trajectories of maternal depression as the way maternal depression progresses across time may be accountable for the complex relation between maternal depression and child maltreatment.

The majority of the studies are correlational. That is, the causal relations between maternal depression, parenting and child maltreatment cannot be identified. This significantly influences the interpretation of the findings. For instance, a study might find that high maternal depressive symptoms are related to high support from the father of the baby. However, because the study is not causal, we cannot determine whether the high depressive symptoms caused more involvement of the father, or whether the frequent father involvement, perhaps in a form of maladaptive engagement of father, led to a mother's depressive symptoms, limiting our knowledge around the mechanism by which maternal depression relates to father support. That said, several theoretical perspectives on maternal depression, adolescent parenthood, and child maltreatment give us guidance in plausible directions of the relations between relevant factors.

Thus, even when the designs do not support definite causal relations, we can interpret the findings with a level of certainty in how the directions of the relations examined should play out. The current study, thus, determined the direction of the relations examined based on the theoretical frameworks.

The samples used in studies often are not representative of the adolescent mother population. While some studies specifically focus on a particular ethnic group that is considered at high risk for maternal depression and child maltreatment (e.g., African American), some studies use a convenient sampling design, which attracts a particular subset of adolescent mothers to the studies; this, in turn, can limit the generalization to the population. Moreover, studies include samples with different subsets of risk factors (e.g., low income, childhood maltreatment history). While these varying sample characteristics can increase the external validity of the findings, these can also create difficulty in comparing results across studies.

Relevant to this issue is the inconsistent use of randomized controlled trial methods to assess program effects. While some studies do adhere to the use of randomized controlled trials to examine whether the program made impact on maternal depression and child maltreatment, some studies do not include the control group, which can limit the examination of programs' causal effects. That said, some experts suggest that systematic approach to improving the quality of program service delivery is still valuable to examining program effects (Gray, 2001; LeCroy & Milligan Associates, Inc., 2010; Sackett et al., 2000), suggesting the richness of information that can still be obtained through examinations of program that do not utilize randomized controlled trial. Since the focus was not on a particular group of adolescent mothers at risk, the current study examined a diverse sample of adolescent mothers and examined the role of home

visitation program based on the actual utilization of program services rather than status in the randomized controlled trial.

Overall Summary of the Literature

Maternal depression diminishes parenting competence and confidence among adolescent mothers, increasing risk for parenting challenges and child maltreatment that may result in serious physical, cognitive, and socioemotional difficulties (Easterbrooks et al., 2013; NRC&IOM, 2009). Despite what appears to be a detrimental impact of maternal depression on adolescent parenting and children's outcomes, the link between maternal depression and child maltreatment is still inconclusive; many young mothers who experience depression are successful parents (Easterbrooks et al., 2010). Such variability in parenting outcomes highlights bio-ecological model (Bronfenbrenner & Morris, 2006), which emphasizes the influences of multiple contexts on a young mother's parenting.

The available evidence suggests that the chronicity and severity of maternal depression may determine the course of child maltreatment. Moreover, a young mother's early parenting practices may be a precursor to child maltreatment. Many young mothers do become successful in raising their children (Easterbrooks et al., 2010); thus, protective factors such as a mother's cognitive ability to mentalize her child's mental state, her relationship with the father of the baby, and her participation in a home visitation program, may alleviate the negative effect of maternal depression and promote positive parenting (Beers & Hollo, 2009; Bunting & McAuley, 2004; Huang & Lee, 2008; McDowell & Parke, 2005). This dissertation aimed to disentangle the links between maternal depression and child maltreatment by examining the contribution of depression chronicity/severity and early parenting, and the role of these protective factors in promoting positive early parenting.

Research Questions of Dissertation

The overall aim of this dissertation was to further understand the nature of associations between maternal depression and child maltreatment among adolescent mothers during the early years of a child's life. Informed by theories and previous empirical investigations, this dissertation tested conceptual models (see Figures 2 through 7) in which different research questions and hypotheses about the link between maternal depression child maltreatment were considered. The research questions examined in this dissertation were:

1. Research question #1 (RQ1): What are the trajectories of depression among young mothers across their children's first two years of life (see Figure 2)?
 - a. Hypothesis 1. Mothers will show different trajectories of depression, and the possible trajectories expected are: stably low depressive symptoms, stably high depressive symptoms, and increasing or decreasing depression.

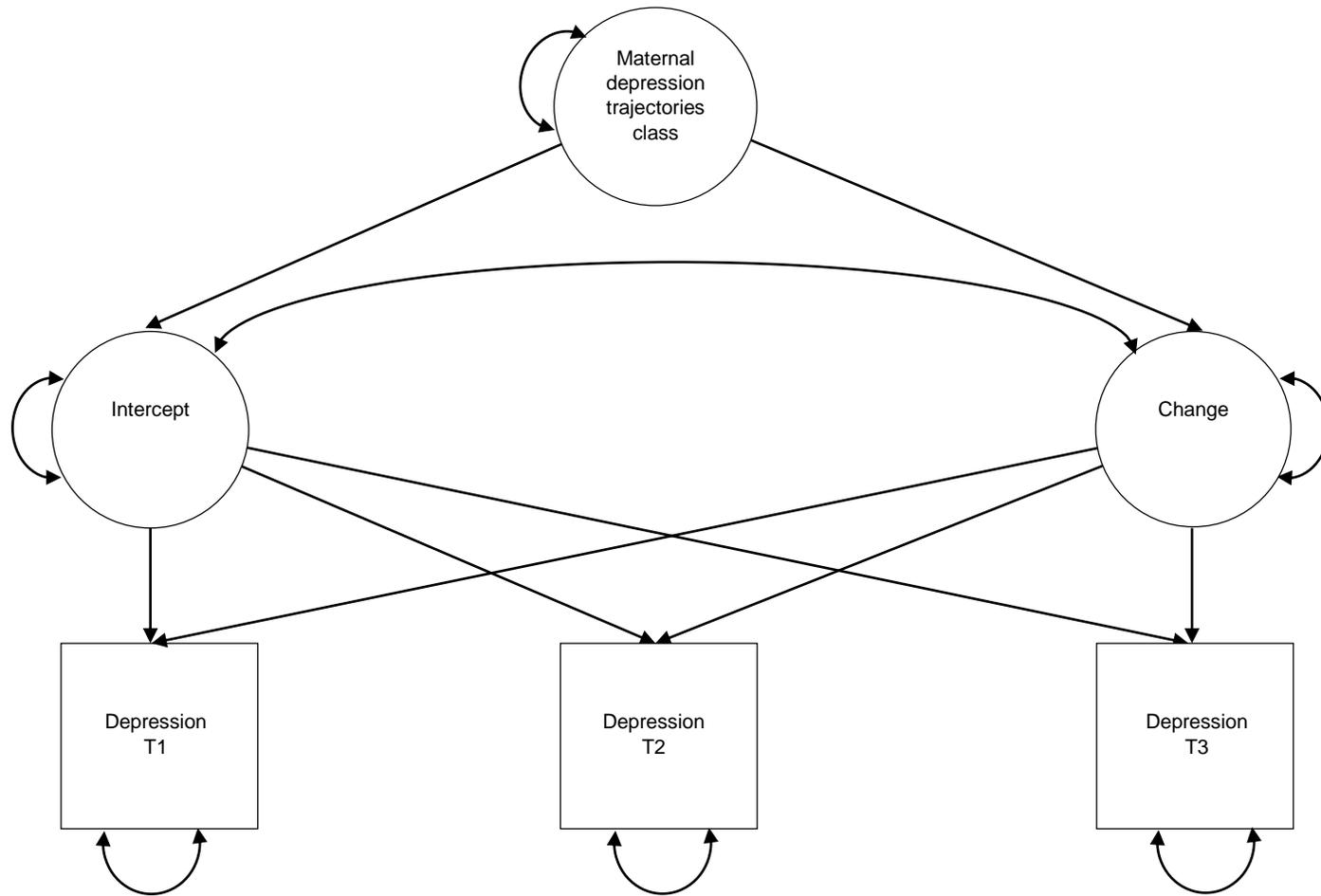


Figure 2. Model that represents the maternal depression trajectories (Research question #1).

T1 = Time 1; T2 = Time 2; T3 = Time 3; Constructs in circle represent latent constructs and square denotes observed indicators.

2. Research question #2 (RQ2): Does the occurrence of child maltreatment vary across different depression trajectory profiles (see Figure 3)?
 - a. Hypothesis 2. The different trajectories of maternal depression will be related to different frequencies of child maltreatment reports; chronically depressed mothers will have the highest number of child maltreatment reports, and consistently non-clinically depressed mothers will have the fewest number of child maltreatment reports.

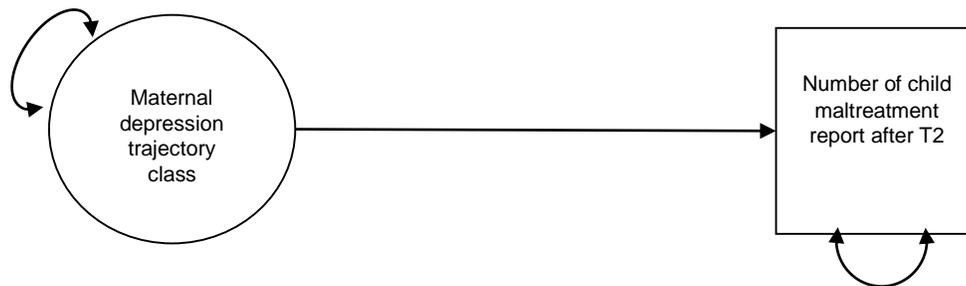


Figure 3. Proposed structural model that represents the relations between maternal depression trajectories and child maltreatment (Research question #2). T2 = Time 2; Constructs in circle represent latent constructs and square denotes observed indicators.

3. Research question 3 (RQ3): Does early parenting predict the number of child maltreatment reports, with different associations across different depression trajectories (see Figures 4)?
 - a. Hypothesis 3. Parenting will be related to the number of child maltreatment reports, such that lower scores on parenting will be related to higher numbers of child maltreatment reports. The strength of such an association may be variable across different depression trajectory groups; for instance, chronically depressed mothers may exhibit a stronger association, given the additive risk of being depressed (e.g., insensitive parenting along with chronic depression may be linked to more frequent records of child maltreatment).

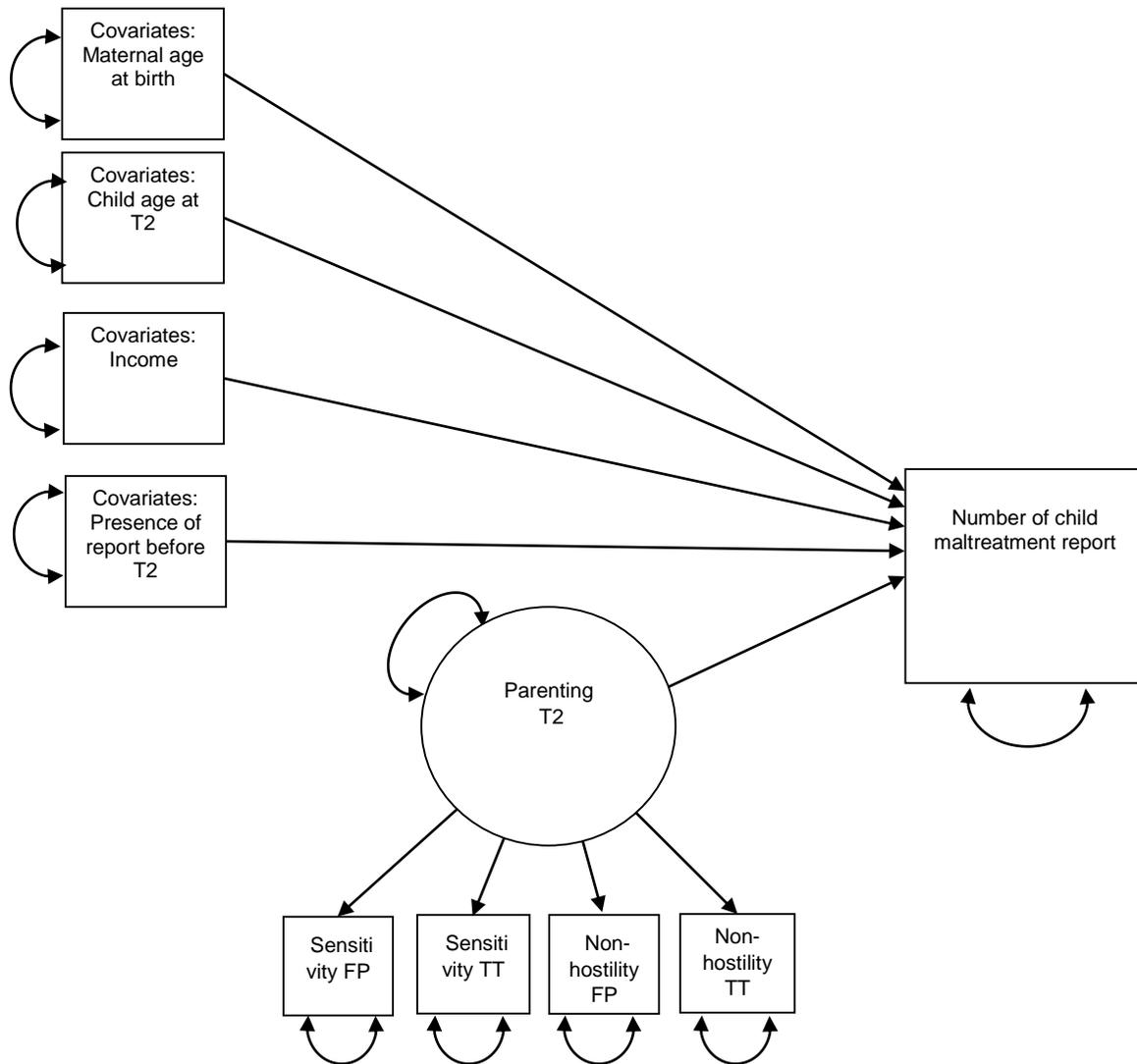


Figure 4. Proposed structural model that represents the relations between parenting and number of child maltreatment reports, moderated by depression trajectory groups, with covariates (Research question #3).

FP = Free play; TT = Teaching task; T2 = Time 2; Constructs in circle represent latent constructs and square denotes observed indicators.

4. Research question #4 (RQ4): Do three selected protective factors: (a) mother's cognitive ability to mentalize her child's mental states, (b) her relationship with the father of the baby, and (c) her participation in a home visitation program, promote positive early parenting, with different effects across different depression trajectories (see Figure 5-7)?
 - a. Hypothesis 4. The presence of these protective factors will promote early positive parenting, and the strength of the associations between these protective factors and parenting will vary by maternal depression trajectories. For instance, based on the resilience framework, a positive partner relationship may promote sensitive parenting behaviors among chronically depressed mothers, but such association may not be significant among mothers who were never depressed.

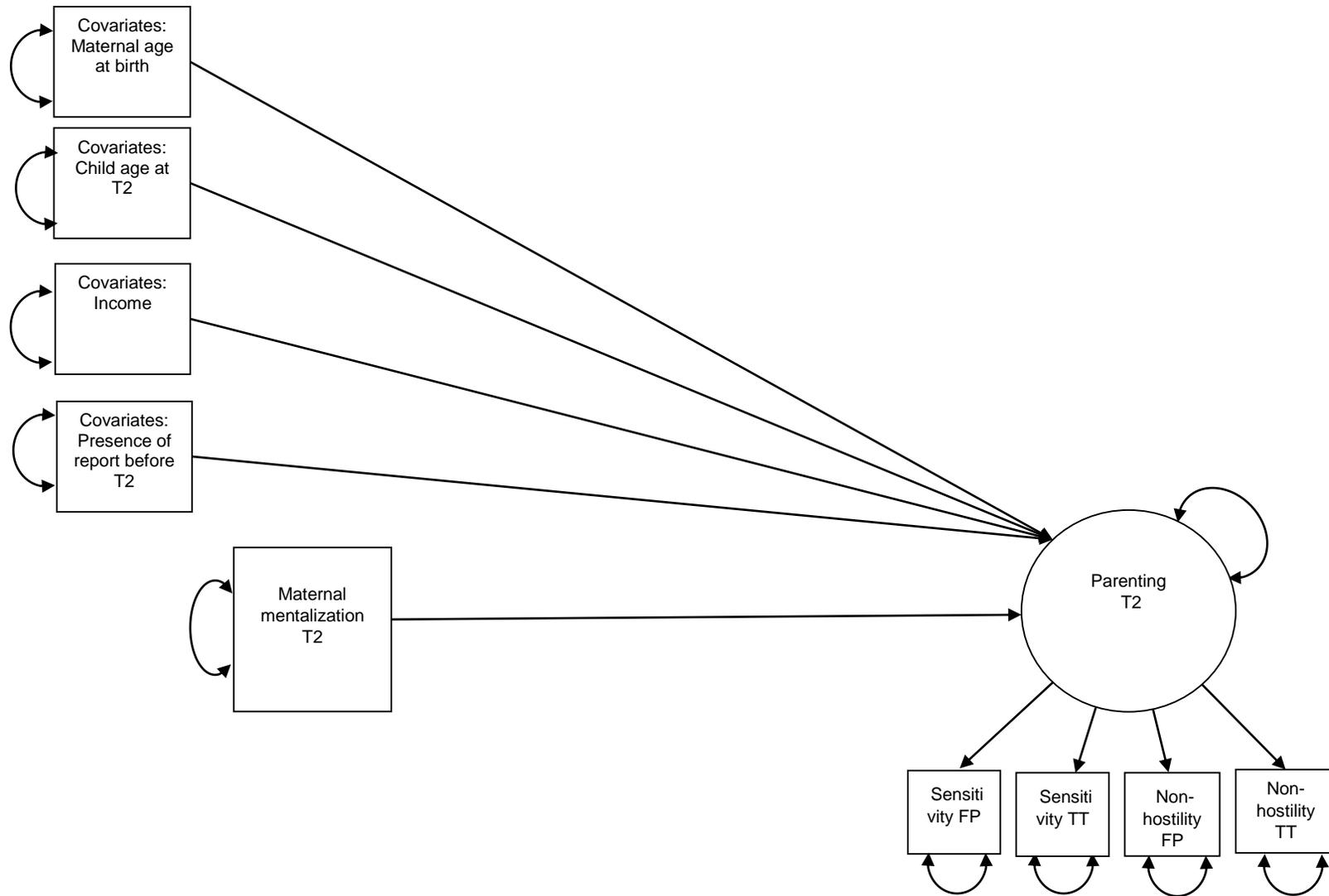


Figure 5. Proposed structural model that represents the relations between maternal mentalization and parenting, moderated by depression trajectory groups, with covariates (Research question #4).

FP = Free play; TT = Teaching task; T2 = Time 2; Constructs in circle represent latent constructs and square denotes observed indicators.

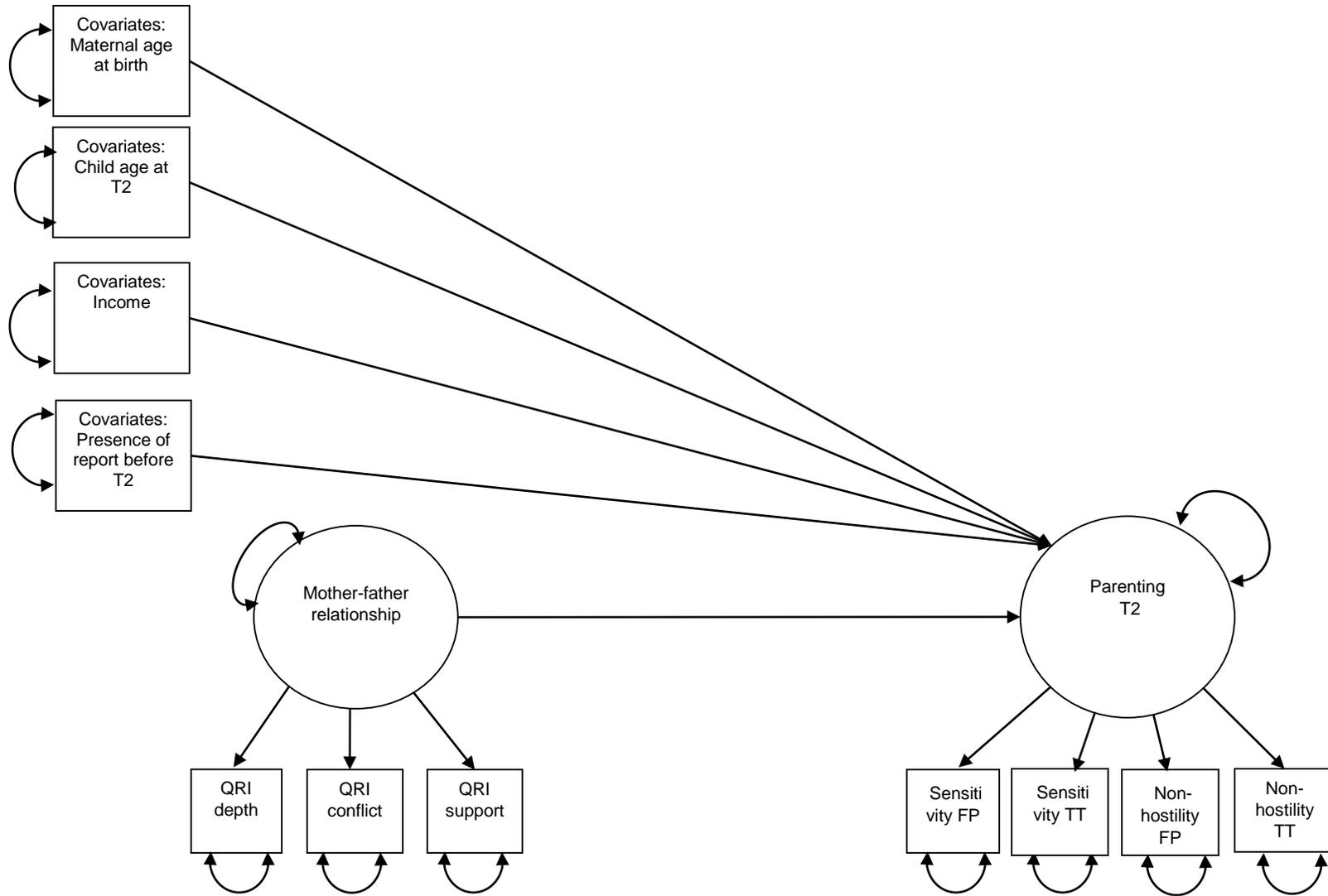


Figure 6. Proposed structural model that represents the relations between mother-father relationship and parenting, moderated by depression trajectory groups, with covariates (Research question #4).

QRI = Quality of Relationship Inventory; FP = Free play; TT = Teaching task; T2 = Time 2; Constructs in circle represent latent constructs and square denotes observed indicators.

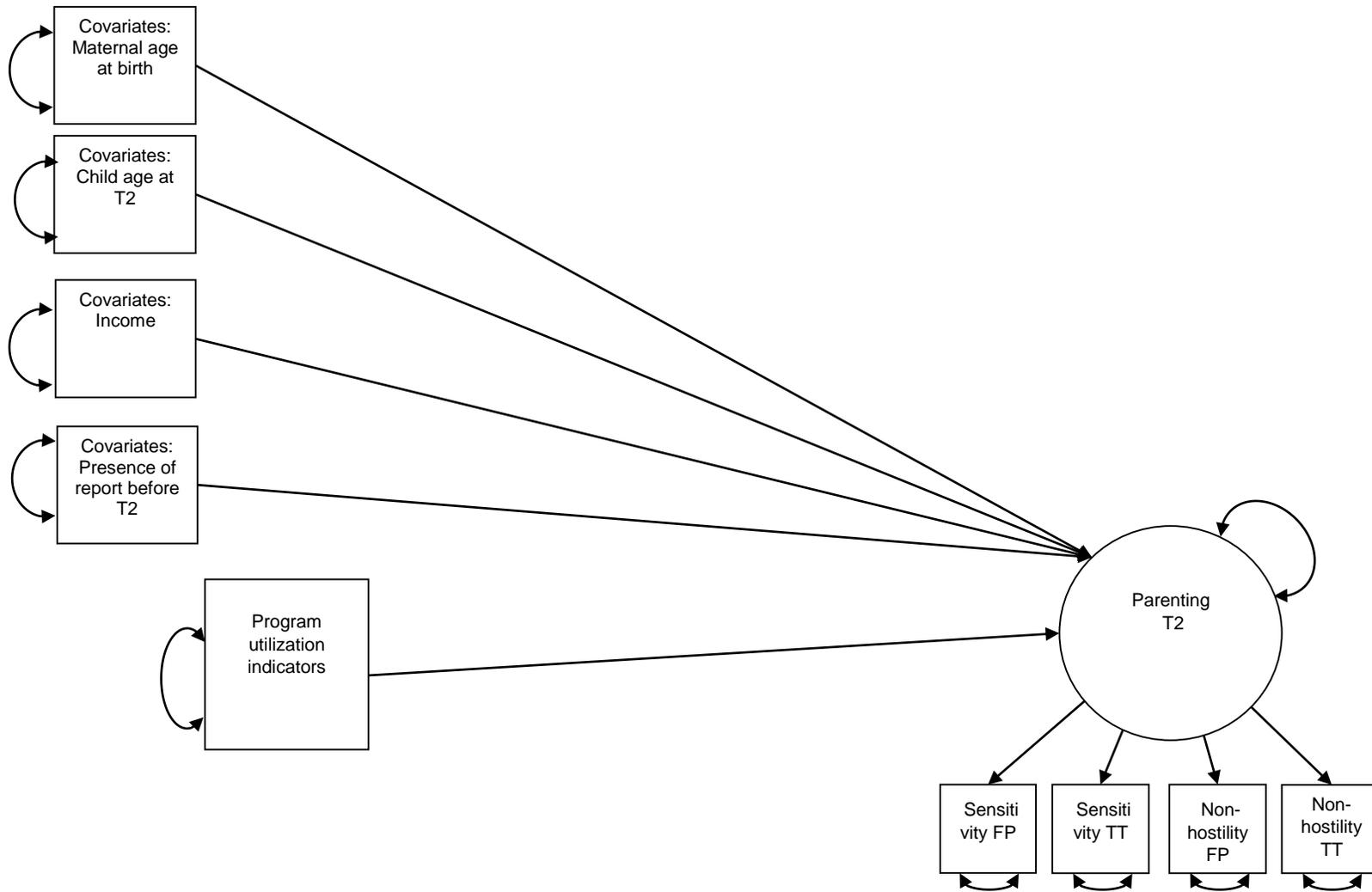


Figure 7. Proposed structural model that represents the relations between program utilization indicators and parenting, moderated by depression trajectory groups, with covariates (Research question #4).

FP = Free play; TT = Teaching task; T2 = Time 2; Program utilization indicators are number of home visits, duration of program enrollment, number of groups, and program intensity (home visits per month); Constructs in circle represent latent constructs and square denotes observed indicators.

CHAPTER THREE: METHOD

Study Design

This study was embedded in a longitudinal randomized, controlled evaluation of Healthy Families Massachusetts (HFM), a state-wide home visiting-based child maltreatment prevention program for first-time mothers under age 21⁵. HFM provides parenting support to young parents from pregnancy until the child's third birthday and was designed to "(1) prevent child abuse and neglect by supporting positive, effective parenting; (2) promote optimal health, growth, and development in infancy and early childhood; (3) encourage educational attainment, job, and life skills among parents; (4) prevent repeat pregnancies during the teen years; and (5) promote parental health and well-being" (Tufts Interdisciplinary Evaluation Research (TIER), 2013, p. 2). Data were collected at three different time points, one year apart, using mixed methods. Maternal and child demographics data and data on maternal depression, parenting, the mother-father relationship, and maternal mentalization were made available through semi-structured interviews, standardized questionnaires, and observations of mother-infant interaction during free play and structured teaching task (see Measures and Constructs section for more details). Child maltreatment data (e.g., substantiated and unsubstantiated reports for each type of child maltreatment by perpetrator) were collected from the child protection agency, the Massachusetts Department of Children and Families (DCF). Program information (e.g. number of home visits) were provided by the Massachusetts Children's Trust. All procedures and measures were approved by the university's Institutional Review Board and participants' consent was obtained before any administration of procedures.

⁵ The evaluation of HFM is called the Massachusetts Healthy Families Evaluation (MHFE) and the principal investigators of the evaluation are Dr. Ann Easterbrooks, Dr. Francine Jacobs, and Dr. Jayanthi Mistry. The original evaluation study was funded by Massachusetts Children's Trust.

Sample

The current study used the data of 508 mother-infant dyads who participated in all three components of data collection (release of DCF data, phone and home interview) at Time 1 (T1) and/or Time 2 (T2). The decision for this selection came in two parts. First, issues of missing data were addressed using Full Information Maximum Likelihood (FIML) (Enders, 2010). However, because those who participated in the home interview were self-selective, the missing information of variables of emotional availability and the mother-father relationship collected during the home interview at T1 and T2 could not be retrieved for those who only participated in the phone interview. Therefore, participants who only participated in the phone interview at both T1 and T2 ($n = 196$) were excluded from the study sample. Second, some of the participants who participated only in the phone interview at T1 decided to participate in the home interview at T2 or vice versa. Therefore, participants who did the home interview either at T1 and/or T2 were included in the study, resulting with a final dataset of 508 mother-child dyads.

Procedure

Families were recruited into the HFM evaluation based on these eligibility criteria: being pregnant or have infants less than 12 months at program enrollment, being female, 16 years of age or older, no prior enrollment in any HFM services, speaking either English or Spanish, and being cognitively able to provide informed consent. Eligible families were randomly assigned to either the Home Visiting (HVS) group (61%) or the control (RIO) group (39%) immediately after providing verbal consent to participate in the study, and those who provided informed consent and seeking HFM were included in the evaluation. A total of 704 participants completed questionnaires and were interviewed. Of these 704, this study included 508 participants, as noted above.

At baseline, mothers who consented to be interviewed were phone interviewed (T1 Intake) and were then visited a few weeks after by a research interviewer for a home interview (T1 RI). Phone and home interviews were conducted by trained research interviewers. During the phone interview, the researcher explained the evaluation study and asked if participants would verbally consent the researchers to access their data from the Massachusetts Department of Children and Families (DCF). During the home interview, a consent form was provided to the participants to sign. They were also asked to complete a set of questionnaires at both interviews. About 12 months and 24 months later, they were followed up for the post-enrollment phone interviews (T2 Intake; T3 Intake) and were then visited at home again for interviews and questionnaires (T2 RI; T3 RI). At the time of T2 home interview, a mother-child interaction was videotaped for five minutes during free play, where mothers were told to play with their children as they normally do at home, and during a five-minute semi-structured teaching task where they were instructed to assist their children to complete a task such as puzzle and block building that was above their children's age level.

Measures and Constructs

Family demographics for descriptive purpose. Data on maternal and child demographic characteristics were drawn from phone interviews and included: child's sex, maternal education, parenting status at study enrollment, whether mother used welfare services since becoming pregnant, maternal self-reported ethnicity, maternal place of birth, father of baby age at study enrollment, father of baby ethnicity, maternal relationship status, and living arrangements.

Covariates.

Maternal age at first birth. Maternal age at a first child's birth was collected during T1 intake. Mothers who were still pregnant at T1 were asked to provide this information during T2 intake. The continuous variable of the maternal age at birth was used in the analyses.

Baby's age at T2 research home interview. The infants' age in months was collected during T2 RI. The continuous variable of the baby's age at T2 RI was used in the analyses.

Income. The median household income of mothers' neighborhood was used as a proxy for mothers' income. U.S. Census Bureau socioeconomic data and Geographic Information Systems software (ArcGIS) were used to obtain the information on median household income at the community block group level, based on mother's address at study enrollment.

Presence of child maltreatment before T2. Whether or not participants had at least one child maltreatment report before T2 was represented by a dichotomous variable, where 1 indicated the presence of reports, and 0 denoting the absence of reports.

Model variables.

Depression trajectory groups. To assess the level of depression among participants, the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used at T1, T2 and T3 (Intake Interviews). The CES-D is a self-report, 20-item scale designed to measure the current level of depressive symptomatology in the general population. Each item consists of a statement related to depressive symptoms (e.g., "I had trouble keeping my mind on what I was doing") and it was rated on a four-point Likert scale, with 0 representing the absence of the depressive symptom stated and 3 being frequent presence of the symptom in the past week. An overall summary score was created, and scores of 16 or higher are considered to be "clinically

significant” (Radloff, 1991). The depression trajectory groups were created using the growth mixture modeling (GMM) based on these summary scores at T1, T2, and T3.

The CES-D has shown strong psychometric properties in both clinical and epidemiological studies with diverse samples (Radloff, 1991; Thombs et al., 2008; Weinberg, Tronick, Beeghly, Olson, Kernan, & Riley, 2001). The reliability and validity of the CES-D had also been well-established with moderate to high correlations between CES-D and other measures of depression and affect functioning (Milette, Hudson, Barron, & Thombs, 2010; Radloff, 1977; Radloff & Locke, 1986). Cronbach’s alpha of the scale in this study was .89 at T1, .90 at T2, and .89 at T3.

Parenting. The quality of dyadic interactions between a caregiver and a child during a five-minute semi-structured free play and teaching task was used to assess the quality of mothers’ parenting behaviors at T2. Mothers’ parenting behaviors were measured observationally using Emotional Availability Scales, Infancy to Early Childhood version (EAS; Biringen, Robinson, & Emde, 1998). The EAS consists of four parental dimensions and two child dimensions, and this study used two of the four parental dimensions, which were *Sensitivity* and *Nonhostility*. *Sensitivity* is a global rating of parental affect, responsiveness, awareness of timing, flexibility, creativity, acceptance, and accessibility. It is rated on a nine-point Likert scale: 1 reflects highly insensitive parenting where a mother is unable to detect and respond to her child’s cues appropriately and engage with her child with marked harshness or passiveness; 5 indicates inconsistent sensitivity where a mother fluctuates from being nurturing and joyful to being preoccupied or losing patience and engaging in intrusive acts; and 9 reflects highly sensitive parenting where a mother is able to recognize and respond to her child’s cues appropriately with flexibility and expresses genuine pleasure and interest in interacting with her

infants. *Nonhostility* assesses the degree of parents' hostility such as impatience, boredom and physical harshness. It is rated on a five-point Likert scale: 1 reflects parents' markedly and overtly harsh behavior, where a mother expresses threats or abrasiveness vocally, facially, and physically (e.g., hitting a child, cold stares); 3 reflects covert hostility, where a mother shows pervasive negative affect such as impatience, discontent and resentment; and 5 reflects nonhostile behavior, where a mother shows no expression of overt or covert hostility toward the child. High scores on both scales indicate positive/high emotional availability. Scores for *Sensitivity* and *Nonhostility* during free play and teaching task were used to create a latent construct of *Parenting*, an overall emotional availability of mothers.

Studies show that the EAS exhibits significant reliability and consistency across contexts and time (Bornstein, Gini, Suwalsky, & Leach, 2006; Bornstein, Gini, Putnick, Haynes, Painter, & Suwalsky, 2006; Bornstein et al., 2008; Easterbrooks, Biesecker, & Lyons-Ruth, 2000; Kang, 2005). Validity has also been established through significant correlations between subscales within EAS ($r=.45$ to $.75$) and also between EAS and other constructs such as attachment and other measures that assess the quality of parenting behaviors (i.e., HOME inventory) (Aviezer, Sagi, Joels, & Ziv, 1999; Kang, 2005; Ziv, Aviezer, Gini, Sagi & Koren-Karie, 2000)

Interrater reliability. Coding of mother-child interaction was performed by three coders. One coder was trained by Easterbrooks and Biringen, who then provided the training to the other two coders. All three coders independently coded the videotaped interactions after the training, but also met regularly to maintain the perspectives learned during training. When disagreements were found in the coding beyond a one-point scale, all three coders discussed until agreement was reached. Coder reliability was assessed using intraclass correlation coefficients (ICC).

ICCs ranged from .75 to .93 ($M = .86$) for *Sensitivity* and .83 to .90 ($M = .86$) for *Nonhostility*, which is a range in reliability from good to excellent.

Maternal mentalization. To assess mothers' proclivity to use mental features in describing their children and their children's behaviors during interactions, scores of Mind Mindedness coding scheme at T2 were used in this study (MM; Meins & Fernyhough, 2010). MM was coded for a five-minute free play, where mothers were told to play with their children as they normally do at home. This study used the observational rating of the MM.

Observational MM identifies mind-related comments made by parents during parent-child interactions and, for this study, determines whether the comments are *appropriate*. Appropriate mind-related comments include comments that indicate that the parent is reading an infant's current mental state (e.g., "You want the frog"; "You are so frustrated"), linking current activity with similar events in the past or future (e.g., "Do you remember seeing a camel at the zoo?"), and clarifying the next step when the child has lost focus. The scores of appropriate comments are determined by calculating the proportion of appropriate comments compared to the total number of comments made during the interaction. The MM coding scheme has shown good reliability in general sample of parents as well as in clinical samples with mental illnesses (Laranjo et al., 2008; Lundy, 2003; Meins et al. 2001; Pawlby et al., 2010). A continuous observed proportion (in percentage) of appropriate comments was used in the analyses.

Interrater reliability. Coding of mother-child interaction was performed by five coders. Coders were trained to code observational MM using the Meins and Fernyhough (2010) Mind-Mindedness Coding Manual (version 2.0). Approximately 25% of the cases were reviewed by more than one coder. All five coders independently coded the videotaped interactions after the training, but also met regularly to maintain the perspectives learned during training. When

disagreements were found in the coding, coders discussed until agreement was reached. Coder reliability was assessed using intraclass correlation coefficients (ICC). The ICC for the appropriate mind-minded comments is .96.

Mother-father relationship. The quality of the mother-father relationship was assessed using Quality of Relationships Inventory at T2 (QRI; Pierce, Sarason, & Sarason, 1991). The QRI is a self-report measure that consists of 25 questions about the mother's relationship with the father of the baby and uses 4-point Likert scale, ranging from "not at all" to "a lot". The QRI has three subscales that measure levels of *emotional support*, *ongoing conflict*, and *depth* in her relationship with her partner. *Emotional Support* reflects how confident the mother felt in relying on the father of the baby for support (e.g., "To what extent can you count on this person to listen to you when you are very angry at someone else"). *Ongoing conflict* indicates the mother's report on the degree in which conflicts existed in her relationship with the father of the baby (e.g., "How much do you argue with this person"). Because the statements in this subscale was related to non-supportive component of the relationship, they were reverse-coded. *Depth* reflects the mother's report on the significance of her relationship with the father of the baby (e.g., "How significant is this relationship in your life"). Higher scores on each subscale indicated supportive mother-father relationship. In this study, the scores for each subscale were used to derive the latent construct of *mother-father relationship*.

The QRI has established good reliability and internal consistency in both clinical and nonclinical research and has been validated in other languages (Pierce, Sarason, Sarason, Solky-Butzel & Nagle, 1997; Reiner, Beutel, Skaletz, Brahler, & Stobel-Richter, 2012; Verhofstadt, Buysse, Rosseel, & Peene, 2006). Cronbach's alpha of the subscales at T2 in this study was .96 for *Support*, .90 for *Conflict*, and .95 for *Depth* subscale.

Program utilization. Selected indicators of program utilization were examined: 1) number of home visits received, 2) duration of program enrollment, 3) number of groups (e.g., parenting classes) participated, and 4) program intensity (i.e., how many home visits received per month). To ensure that predictive variables were measured before the dependent variable, these components were calculated from mothers' first enrollment to the T2 phone interview. Thus, observed number of home visits received, number of groups participated, duration of program enrollment, and number of home visits per month (intensity) between enrollment and the T2 intake were used in the analyses.

Even though they were randomly selected to be in the home visiting group (HVS; $n=298$), some mothers in the home visiting group did not receive any services between enrollment and T2 intake. Twenty one (7.05%) did not receive any home visits and 151 (50.7%) did not participate in any groups between enrollment and T2 intake. This may suggest that analyzing the role of selected program utilization indicators based on randomly assigned home visitation group may not necessarily portray the influences of the actual program service usage and delivery. Furthermore, using randomly assigned group status in analyzing program utilization indicators would exclude mothers in the control group since they did not receive any home visitation, which would significantly reduce the study sample (reducing by 41.3%) by only allowing mothers in the home visitation group to be included in the analysis and significantly limit the possible analytic approach chosen for the analyses in this dissertation. Although some limitations may be present, to portray different levels of program utilization (e.g., longer vs. shorter duration) in a continuum and to retain the full study sample, this study analyzed the program indicators using observed continuous variables, regardless of the random assignment

status of the participants. In this approach, mothers who did not receive HFM service, regardless of whether they were in the HVS or RIO, were counted as 0 for the four selected indicators.

Child maltreatment. The total number of child maltreatment reports was examined using maltreatment records obtained from the Massachusetts Department of Children and Families (DCF), which included the information on the types of maltreatment perpetrated, the allegation decision of the report (e.g., substantiated vs. unsubstantiated), and the perpetrator identity (e.g., mother as perpetrator or other person as perpetrator). Based on the Memoranda of Understanding (MOUs) established between the Children's Trust and the Department of Children and Families (DCF), DCF agreed to annual data transfers to the evaluation project. To ensure that the outcome variables were measured after the predictive variables, available records covering the time period after T2 interview were used. An observed count variable of child maltreatment reports was used in the analyses.

To address the issue of underrepresentation of maltreated children (DePanfilis, 2006), the reports were examined regardless of the allegation decision. When reports are considered unsubstantiated, it does not necessarily mean that the maltreatment was absent. Often times, children whose reports were not supported experience repeated reports of child maltreatment, at a rate that is as high as for substantiated reports (Drake, Jonson-Reid, Way & Chung, 2003; Kohl, Jonson-Reid, Drake, 2009), and they experience similar developmental outcomes as children whose reports were substantiated (Hussey et al., 2005). Depending solely on the allegation decision by the child welfare system to determine the presence of maltreatment may also not depict the full nature of the child maltreatment experienced by a child (Bartlett, 2012; Cross & Casanueva, 2009; Yuan, Schene, English, & Johnson, 2005). Given the detrimental impact of child maltreatment, including both substantiated and unsubstantiated reports would

prevent the exclusions of infants who may fall through the cracks, but are still in danger for child maltreatment, and also depict fuller picture of child abuse and neglect (Bartlett, 2012). These reported incidents could be perpetrated by both the mother and other persons because a mother who allowed others to perpetrate was unable to be the gatekeeper for her child's well-being, which could also be considered a "maltreating" behavior on her part.

Analytic Strategy

The patterns of maternal depression trajectories among adolescent mothers across three time points were identified using growth mixture modeling (GMM). GMM is an appropriate statistical procedure because it allows testing for differences in growth parameters across subgroups and estimating separate intercepts, slopes, and variance for each subgroup (Jung & Wickrama, 2008; Muthén & Asparouhov, 2006). The number of trajectory pattern was determined by examining the totality of these criteria: 1) distinctive profiles yielded by clusters, 2) value of entropy is more than 0.8, indicating better classification of participants, 3) smallest value of Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), suggesting most minimal information lost in the model and better model fit, and 4) statistical significance of Lo-Mendell-Rubin Test (LMR) and Bootstrapped Likelihood Ratio Test (BLRT), indicating improved model fit (Geiser, 2013). The criteria were used as a guideline rather than as absolute requirement in determining the number of maternal depression trajectories.

To examine whether different trajectories of maternal depression are linked to varying rates of child maltreatment (RQ2), multiple group negative binomial regression (multigroup NB) was employed, where the observed mean number of child maltreatment reports was compared across depression trajectory groups. Negative binomial regression is an appropriate approach to

examining count data with overdispersion, or a large variability in data, providing a more accurate standard error, compared to Poisson regression model, which is a more common approach to analyzing count data and requires expected means and variance to be equal (Cameron & Trivedi, 2013; Jewell & Hubbard, 2006). When count data are overdispersed, the expected means and variance are not equal, making negative binomial regression a better statistical model for this study.

To examine the relations between parenting and child maltreatment (RQ3), and between selected protective factors and parenting across different maternal depression trajectories (RQ4), a measurement model was first utilized to establish the invariance of latent constructs (parenting and mother-father relationship) across groups. A multigroup NB was then utilized to analyze the predictive relation between parenting and child maltreatment, and the association between parenting and selected protective factors was examined using multiple group structural equation model (multigroup SEM) with MPlus 7. SEM of latent constructs allows correction for measurement error that, if not taken care of, can bias the parameter estimates (Brown, 2006). Again, negative binomial regression is an appropriate approach to examining count data with overdispersion, or a large variability in data, providing a more accurate standard error (Cameron & Trivedi, 2013; Jewell & Hubbard, 2006).

In the models examined in this dissertation, constructs in circle represented latent construct and squared constructs denoted observed indicators. In examining the measurement models, correlation between parenting and mother-father relationship was represented using double-headed arrows (Figure 8). Double headed arrows were also used to represent variance of factors and residual of indicators. As illustrated in the proposed structural models (Figure 2 - 7), a single-headed arrow indicated the predictive relation between the constructs and indicators. In

these structural models, double-headed arrow represented the variances of factors and indicators, and residuals of indicators. The differential effects of maternal depression trajectories were accomplished by employing multigroup NB and SEM. The effect of each protective factor was examined in separate models.

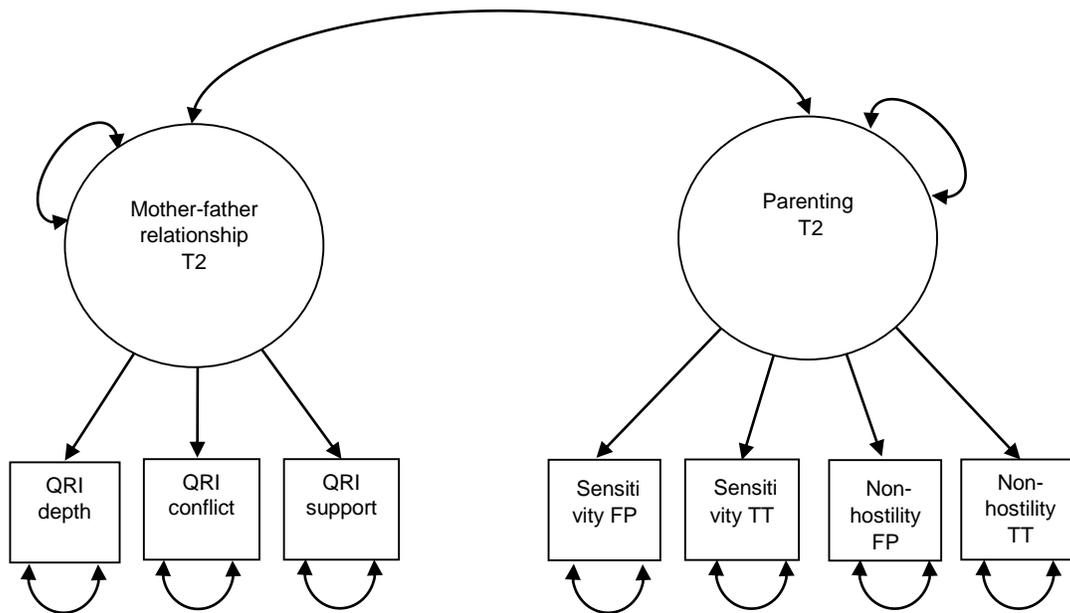


Figure 8. Proposed measurement model that represents the relations between mother-father relationship and parenting.

QRI = Quality of Relationship Inventory; FP = Free play; TT = Teaching task; T2 = Time 2.

Measurement model and invariance. There were two latent constructs in the models to be examined: parenting at T2 and mother-father relationship at T2. The construct of parenting at T2 was defined as an overall emotional availability of mothers during mother-child interactions. This construct was defined by four indicators: *Sensitivity* at free play and teaching task, and *Nonhostility* at free play and teaching task. The construct of mother-father relationship was defined as the mother's overall perception of relationship with the father of the baby. This construct was defined by three indicators, which derived from the subscales of the QRI measure: *Emotional Support*, *Conflict*, and *Depth* subscales.

In order to compare latent parameters, the measurement model was first tested for its measurement invariance across depression trajectory groups through confirmatory factor analysis. In this study, the measurement invariance testing occurred in three steps: 1) a test for configural invariance, which assumed that the pattern of fixed and free parameter estimates were equivalent across group, 2) a test for weak factorial invariance, which assumed that the factor loadings (λ) were equal across groups, and 3) a test for strong factorial invariance, which assumed that the indicator means (intercepts) were equal across groups. For steps 1 through 3, the scale was set using an effects coding identification method (Little, Slegers, & Card, 2006), where the average of the factor loadings and indicator intercept was fixed at 1 and 0, respectively, for the reference group.

Relative patterns of the latent covariance/variance matrix as well as of latent means were explored through the homogeneity of variance/covariances test and homogeneity of the means test. The homogeneity of variance/covariances assumed that the latent variances and covariances were equal across groups. The homogeneity of means assumed that the latent means were equal

across groups. If these invariance tests were not tenable, then they were rerun, examining the invariance separately across each pair of groups.

Criteria for measurement invariance and model fit. Each measurement invariance test yielded model fit statistics of Full Information ML χ^2 , Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI/NNFI). Because FIML was used as a method of estimation, CFI and TLI were calculated by hand⁶. Model fit was determined by examining the totality of the fit indices using these guidelines: RMSEA was less than or equal to .08, and CFI and TLI was more than or equal to .9. These values were used as a guideline for determining the model fit rather than as absolute criteria for model fit.

For the configural invariance test, a measurement invariance was achieved if the model fit was good and the overall patterns of factor loadings and/or intercepts were similar across groups. Since a χ^2 difference test is too sensitive to trivial fluctuation, it is best to use the changes in the values of RMSEA and CFI to determine measurement invariances (Little, 2013). For the weak factorial invariance test, a measurement invariance was achieved if the RMSEA fell in the confidence interval of the RMSEA obtained in a configural invariance test and the change in CFI between weak and configural models were less than or equal to .01 (Cheung & Rensvold, 2002). Similarly, a strong factorial invariance was achieved if RMSEA fell in the confidence interval of RMSEA obtained in a weak factorial invariance test and the change in CFI between strong and weak factorial models were less than or equal to .01 (Cheung & Rensvold,

⁶ Because multigroup model was used, an alternative null model was calculated. An alternative null model assumed that all covariances are zero, and the corresponding variances and the intercepts of each indicator are equal across groups.

2002). For the homogeneity of variance/covariance and means test, a χ^2 difference test was utilized.

If the invariance of variance/covariance was not attained, then a follow up comparison of a model was conducted to determine if the differences were expressed in the variance of the construct and/or the covariances between the constructs. These follow up tests were also re-examined by examining across each pair of groups, if invariance was not attained. Similarly, if the invariance of the mean was not attained, then a follow up comparison of a model was conducted, where the invariance across each pair of groups were examined separately.

Structural model and concepts. In examining the structural models, all of the predictive relations (single-headed arrows) were included in the models, as well as covariates and their predictive relations with the model constructs. Maternal age at birth and income were controlled, given research suggesting that younger mothers (17 and younger) and those in low-income may have prolonged elevated symptoms of depression (Ammerman et al., 2009, 2010). Furthermore, child's age at T2 was included to account for the timing of the depressive symptoms and study enrollment relative to childbirth, and the presence of child maltreatment reports prior to T2 was included to control for the varying level of exposure to child maltreatment before T2.

Structural models with the covariates were first tested (M1; Model 1), and the final structural models that included only the model variables and statistically significant covariates were tested (M2; Model 2). In M1, each covariate was included simultaneously initially, and its significance was examined one at a time. Insignificant relation of each covariate was then excluded one at a time to formulate the final structural model (M2). In the final model, significant covariates and model variables were examined one at a time, and each insignificant

relation was taken out one by one until the model reached its most parsimonious state (i.e., absence of insignificant relations).

Criteria for structural model fit. A structural model analysis of child maltreatment report (count data) yielded a model fit statistics of log-likelihood (LL), AIC, BIC and sample-size adjusted BIC. A structural model analysis that involved protective factors and parenting yielded model fit statistics of Full Information ML χ^2 , Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI/NNFI).

A χ^2 difference test was utilized to examine the fit of the model and the significance of the predictive relations between constructs. In order to use this difference test for the models with child maltreatment report (count data), Satorra-Bentler scaled (mean-adjusted) chi-square (TRd) was calculated, which allows better approximation of chi-square under non-normality (Satorra & Bentler, 1999). This significance test occurred in two steps using nested model comparison: 1) a comparison between a structural model that freely estimated the regression coefficient (beta) across groups and a constrained structural model that equated the estimations of regression coefficients across groups, and 2) contingent upon meeting step 1, a comparison between a constrained structural model that equated the estimations across groups and a constrained structural model that fixed the estimations across groups to zero. First, insignificant χ^2 difference test indicated that a more restrictive model was a better fit to the data. Second, when TRd or a change in χ^2 between the structural models in the first step was not significant, one could state that the estimations were equal across groups. If significant, the comparison was repeated for each pair of groups separately. When TRd or a change in χ^2 between the structural models in the second step was significant, one could state that the predictive relation was

significant. Again, the comparison was repeated for each pair of groups separately if TRd or a change in χ^2 were significant.

Missing data. The dataset used in this study had missing data (M=24.5%; range=0-57.1%) due to attrition as well as other unforeseeable data collection challenges (e.g., skipping items unintentionally, measures not included in the protocol). FIML was used to deal with the missing data issue. Since FIML produces estimates that were unbiased, minimizes the uncertainty of estimation, improves power, and improves representativeness of the dataset and generalizability of outcomes, it is considered the preferred strategy over procedures like listwise deletion, mean substitutions, and single imputation in dealing with data that is MAR (Allison, 2002; Enders, 2010; Widaman, 2006).

CHAPTER FOUR: RESULTS

Characteristics of the Full Study Sample

The descriptive characteristics of the full study sample are presented in Table 1. The study sample was examined on its demographic characteristics, rate of child maltreatment reports, scores on parenting, the quality of mother-father relationship, and program utilization. The attrition of participants was also examined.

Child, parent, family and environmental demographic characteristics. The sample was diverse, with non-Hispanic White (35.7%) and Hispanic (36.1%) being the largest groups, followed by non-Hispanic Black (20.3%) and non-Hispanic Others, including multiracial (7.9%). Most of them were born in the United States (81.2%) and many were born in Massachusetts (68.6%). The average median household income, based on Census data, was \$38,006, and 22.1% were receiving welfare by T1.

Mothers enrolled in the evaluation at, on average, 18.6 years of age ($SD = 1.33$) and about two thirds of them were pregnant at evaluation enrollment (69.3%). The mean age of the father of the baby at evaluation enrollment was 21.01 ($SD = 4.37$). At birth of their first child, mothers were, on average, 18.79 years old ($SD = 1.29$); about half of their children were boys (52.4%). At T2, the mean age of these children was 11.92 months ($SD = 5.18$).

About a third of mothers (38.9%) had completed high school/GED at T1, and by T3 most had completed high school/GED while parenting (72.1%). Most mothers lived with parental figure(s) (with or without partner) at T1 and T2 (78.2% and 72.4%, respectively), but the rate dropped to 56.8% by T3. Most mothers did not co-reside with the father of the baby at each time points (T1 = 25.9%; T2 = 31.7%; T3 = 25.5%). At T1, more than half of mothers were in a relationship with the father of the baby (65.3%). However, many mothers were no longer with

the father of the baby at T2 and T3, where the proportion of mothers who were in a relationship with the father of baby has steadily dropped to 53.5% and 38.7% at T2 and T3, respectively.

Rate of child maltreatment report. Most of the children had no reports before T2 (63.8%). About 20.7% of participants had at least one report before T2 (only before T2 or in combination with reports after T2), and 15.6% had reports only after T2.

The number of child maltreatment reports recorded by DCF since T2 ranged between zero (no report) and four. Most of the children in the sample did not have any reports since T2 (76.8%); 15.9% had one report, 5.3% had two reports, 1.4% had three reports, and .6% had four reports. Of those who had at least one report of abuse and neglect since T2, a little more than half were substantiated by DCF. Most of the reports, substantiated or unsubstantiated, were of neglect (82.2%). Only 1.7% of reports were physical abuse only, 0.8% were sexual abuse only, and 15.3% were reports of neglect in combination with physical or sexual abuse. In addition, most of these reports were perpetrated by children's mothers (82.1%; alone or in combination with other perpetrator); 17.9% of reports were perpetrated by someone other than the mother. This information on perpetrator and maltreatment type is presented for descriptive purpose for the full sample only,

Parenting. The average score of mothers' sensitivity during free play and teaching task was 4.83 (SD = 1.59) and 4.57 (SD = 1.33), respectively. These scores indicate inconsistent sensitivity, where a mother is able to respond to a child's needs in a sensitive and appropriate manner, but also exhibit some questionable behaviors (e.g., occasional intrusiveness). Mothers showed slight covert hostility toward their children during both free play (M = 4.26, SD = 0.93) and teaching task (M = 3.95, SD = 0.99).

Protective factors. About 7.63% (SD = 8.56) of the comments made during mother-child interaction were appropriate mind-related comments. In general, they reported that their relationship with the father of the baby was somewhat valuable to them (QRI depth; M = 1.73, SD = 1.11), involved some conflict (QRI conflict; M = 1.76, SD = 0.73), and they considered the father of the baby as somewhat reliable and supportive (QRI support; M = 1.76, SD = 1.24). Among the mothers who were selected to receive home visitation, the average program duration between program enrollment and T2 is about 9.5 months and, on average, mothers received 18 home visits. These visits occurred at a rate of less than two home visits a month. Mothers also participated in less than two group activities between enrollment and T2.

Attrition. By T3, 46 (9.1%) mothers had attrited from the study. When comparing mothers who remained to those who had attrited at T3, the groups differed in the parenting status at enrollment ($\chi^2(1) = 4.06, p = .044$) and their relationship status at T2 ($\chi^2(1) = 4.43, p = .035$). Mothers in the evaluation study at T3 were more likely to be parenting already at study enrollment than not. Mothers in the study at T3 were also likely to be in a relationship at T2 rather than being single. As mentioned earlier, mothers who participated in the evaluation were those who were seeking and recruited into HFM services. Therefore, these sample differences may be expected, as those who participated in the evaluation may have felt that program was more relevant to their parenting and had more space in their lives to participate in the evaluation (e.g., being with significant other who may provide support). The two groups were statistically equivalent on all other background characteristics.

Research Question 1: What Are the Trajectories of Depression Among Young Mothers Across Their Children's First Three Years of Life?

GMM was used to estimate the depression trajectories using depression scores at T1, T2 and T3. Several trajectory patterns were explored, and based on the established criteria, the analysis found five viable trajectories of maternal depression: Stable-non depressed, Stable-low depressed, Stable-high depressed, Decreasing, and Increasing. A five group solution had the smallest AIC (10126.88), BIC (10219.952), and sample-size adjusted BIC (10150.12), entropy larger than .8, and significant BLRT ($p < .000$), which statistically indicated five group solution as a better fit than a four group solution. It also provided a distinctive profiles that were distinguishable from each other and consistent with previous evidence that illustrate the variability in the experiences of depression across time (Ammerman et al., 2009; Ramos-Marcuse et al., 2010; Sutter-Dallay, Cosnefroy, Glatigny-Dallay & Verdoux, 2012). Table 2 presents the statistical information of the criteria used to determine the most viable pattern of trajectories.

Figure 9 illustrates the mean depression scores of trajectory groups at three time points. The *Stable-non depressed* group was the largest group ($n = 283$; 55.7%); mothers score below the clinical cutoff at all three time points. The next largest group was *Stable-low depressed* ($n = 134$; 26.4%), in which mothers' depression scores hovered around the clinical cutoff across time. *Stable-high depressed* group ($n = 40$; 7.87%) included mothers who exhibited clinical levels of depressive symptoms across three time points. They also exhibited the highest scores on the CESD across three time points (ranging from 29-34), which suggests that mothers experienced depressive symptoms at a severe level. Mothers in the *Decreasing* group ($n = 27$; 5.3%) were clinically depressed at T1 and T2, but recovered at T3. The *Increasing* group was the smallest

group ($n = 24$; 4.7%) and scored below the clinical cutoff for depression at T1 and T2, but became clinically depressed (above cutoff) at T3. Both the *Decreasing* and *Increasing* groups scored severe levels of depressive symptoms (ranging from 21-32) when they exhibited depression above clinical cutoff.

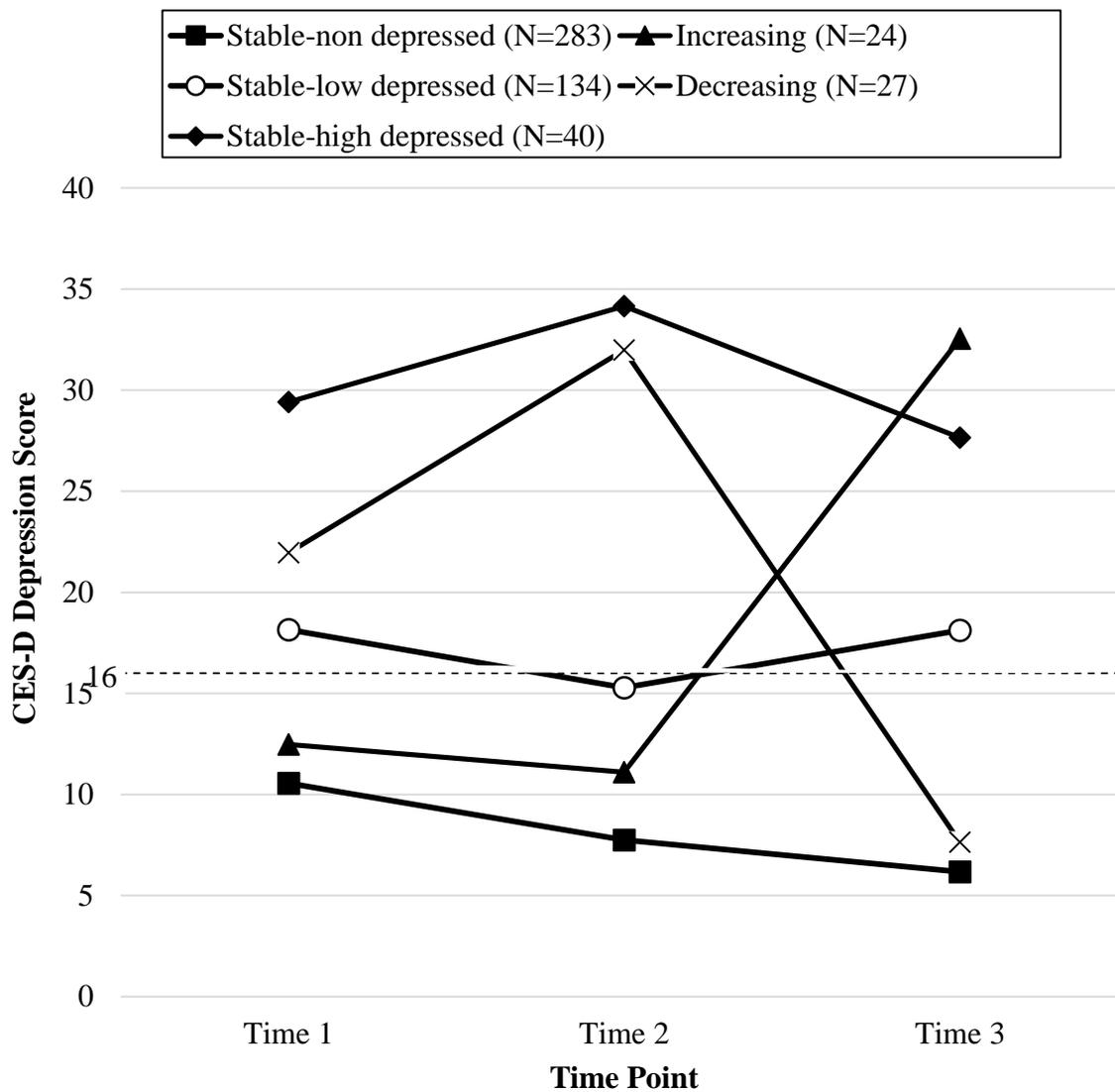


Figure 9. Five patterns of maternal depression trajectories across three time points, with a cut-off score at 16.

Characteristics of five depression trajectory groups. Observed means of selected variables were compared across depression trajectory groups by using χ^2 difference test that compared a model that freely estimated the observed variable means and a model that equated the variable means across groups. Whether the means were equal across groups were tested for each variable at a time.

The results showed that mothers in the five depression groups had similar child, parent, family and environmental demographic characteristics listed in Table 1 (see Table 3 for group characteristics). Most of them were pregnant at study enrollment and majority were non-Hispanic White or Hispanic. On average, between 7.9% and 23% of mothers received welfare and their neighborhood's income ranged between \$32,813 and \$38,968. Up to 42.6% of mothers were single and less than half of the mothers were with the father of the baby by T3. Mothers across depression trajectory groups showed, on average inconsistent sensitivity and minimal hostility while interacting with their children. Mothers also reported that they were somewhat satisfied with the support from the father of the baby and indicated that their relationships with the father of the baby are somewhat valuable. They also showed similarity in the way they utilized the home visiting program; mothers who were selected to receive home visitation were enrolled, on average, between eight and ten months by T2 and received between 16 and 21 visits. They used less than four group activities and received about one to two home visits a month. They also had about one child maltreatment report on average across groups.

However, a χ^2 difference test revealed several distinctive factors that may differentiate these mothers. Mothers' age at enrollment ($\Delta\chi^2(4, n=508) = 11.94, p = .018$) and at first birth ($\Delta\chi^2(4, n=508) = 15.85, p = .003$) were significantly different across groups. Specifically, *Stable-high depressed* mothers (M = 18.00 years at enrollment; M = 18.13 years at birth) were

significantly younger than were mothers in the other four groups at study enrollment and at first birth ($M = 18.62 - 18.88$ years at enrollment; $M = 18.79 - 19.06$ at birth). Mothers also differed in education status ($\Delta\chi^2(4, n=508) = 11.59, p = .02$), where *Stable-high depressed* mothers were more likely to be in HS/GED at T1 (57.5%) than were mothers in the other four groups (19.00% - 40.10%). Among model variables, only QRI conflict scores at T2 were significantly different across groups ($\Delta\chi^2(4, n=508) = 19.36, p = .001$). Specifically, mothers in the *Stable-high depressed* ($M = 1.2$) and *Decreasing* ($M = 1.5$) groups reported more conflict than did those in the other three groups, who were relatively healthy emotionally at earlier time points (*Stable-non depressed*, $M = 1.9$; *Increasing*, $M = 1.7$; *Stable-low depressed*, $M = 1.75$).

Combining *Increasing* and *Decreasing* groups. Given the small sample size of *Increasing* and *Decreasing* depression trajectory groups and the need of relatively bigger sample size for running the multiple group analysis in SEM and NB, I combined them into one group called *Intermittently depressed*, where mothers experienced depressed and non-depressed episodes intermittently across time. The group analyses found that these two groups were similar across child, parent, family and environmental demographic characteristics examined. Thus, four groups were utilized for the subsequent analyses: *Stable-non depressed*, *Stable-low depressed*, *Intermittently depressed*, and *Stable-high depressed*.

Examination of Measurement Model

A measurement model examined parenting and mother-father relationship factors. The initial measurement model had a poor fit, $\chi^2(58, n=508) = 160.983, p < .001, RMSEA = .135_{(.11-.16)}$, TLI/NNFI = .877, CFI = .917. The modification indices of theta (residuals of indicators) indicated several potential places to improve the model fit, and two places were chosen: 1) freeing up the residual covariance between the EA sensitivity and nonhostility during free play,

and 2) freeing up the residual covariance between the EA nonhostility during free play and during the teaching task. Correlating the residual variance of EA sensitivity and nonhostility during free play made theoretical sense because these two indicators shared the similarities in the characteristics of “context” in which the behaviors were evaluated. Similarly, EA nonhostility during free play and teaching task shared the similarities in the characteristics of “features” of Emotional Availability these indicators were measuring. Thus, it made theoretical sense to correlate the residuals among the selected indicators to account for the shared variance explained by the similarities in the context and feature characteristics. This modification in the model improved the model fit to a good fit, $\chi^2(50, n=508) = 68.283, p=0.044, RMSEA = .061_{(.011-.095)}$, TLI/NNFI = .963, CFI = .985 (see Figure 10)⁷.

⁷ To address the issue of negative residual variance, the residual variance of EA sensitivity during teaching task and QRI support were set at zero. This approach is an appropriate method of resolving negative residual variance, when the variance is small and insignificant.

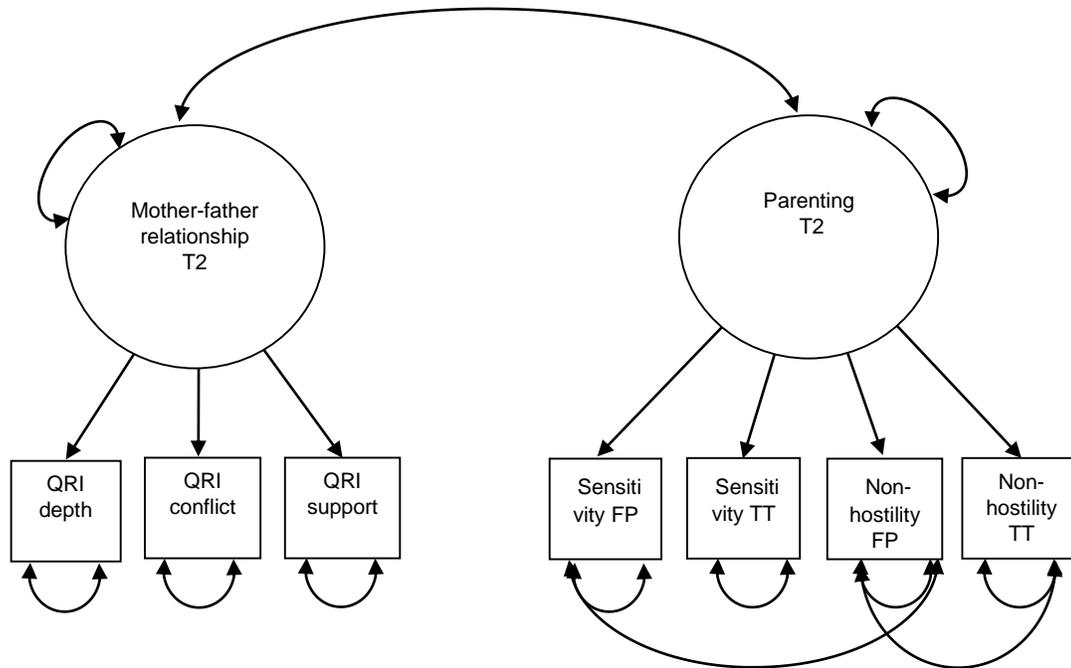


Figure 10. Modified measurement model that represents the relations between mother-father relationship and parenting.

QRI = Quality of Relationship Inventory; FP = Free play; TT = Teaching task; T2 = Time 2.

Measurement invariance. The factor loadings, intercepts, residual variances, and latent mean, variances and covariances of the modified configural, weak, and strong measurement model for the four depression groups are presented in Table 4. The model fit statistics of the measurement invariance testing are presented in Table 5. The configural invariant test showed a good model fit. The result of the weak factorial invariance test revealed that the latent constructs in the model were metrically invariant across groups ($\Delta CFI = .006$, $RMSEA_{Weak} = .041$; $RMSEA_{CI_{Configural}} = .011-.095$). The test for the strong invariant model indicated tenable patterns of the indicator means across groups ($\Delta CFI = .008$, $RMSEA_{Strong} = .052$; $RMSEA_{CI_{Weak}} = .000-.076$). Therefore, it was justified that the patterns of the factor loadings and indicator means for parenting and mother-father relationship factors stayed invariant across groups.

At the latent construct level, the overall test of the homogeneity of variance and covariance indicated that the variance covariance matrix of parenting and mother-father

relationship factors were homogeneous across groups ($\Delta\chi^2(9, n=508) = 9.108, p = 0.427$). The test of latent mean invariance indicated homogeneity of latent means of parenting and mother-father relationship factors across groups ($\Delta\chi^2(6, n=508) = 9.545, p = 0.145$).

Research Question 2: What Are the Relations Between the Trajectories of Maternal Depression and Child Maltreatment?

Negative binomial regression was used to model the relation between maternal depression trajectories and the number of child maltreatment reports. The model fit statistics of the nested model comparisons are presented in Table 6. The nested model comparison found that the constrained structural model that equated the observed mean number of child maltreatment reports across groups was an adequate structural representation of the data ($\Delta\chi^2(3, n=508) = 6.1, p = .107$). Therefore, the constrained model was considered the final structural model. This suggested that when no covariates were considered and included in the model, the trajectories of maternal depression itself were not associated with the number of child maltreatment reports after T2. The observed mean number of child maltreatment reports after T2 suggested that the average occurrence of report was low ($\tau = .311$), ranging from zero to four reports.

Research Question 3: Does Early Parenting Predict Child Maltreatment, with Different Associations Across Different Depression Trajectories?

In examining the hypothesized structural models, all of the relations between model variables were included in the models, as well as covariates and their relations with the model variables (see Figure 4). Based on the examination of the measurement model, factor loadings and indicator means of parenting were equated across groups. Other model indicators,

covariates, and relations between them were freely estimated across groups. The nested model comparison statistics are presented in Table 7.

First, the relation between covariates and child maltreatment was tested (M1). The nested model comparisons revealed that maternal age at birth, child age at T2, and income did not contribute significantly in predicting the number of child maltreatment reports across groups; thus, their relations with the outcome were excluded from the final model. Presence of child maltreatment reports before T2 was significantly associated with the number of child maltreatment reports after T2 across groups; when at least one report, substantiated or unsubstantiated, was present before T2, the number of reports filed after T2 increased ($\beta = 0.686$; $\Delta\chi^2(1, n=508) = 14.404, p < 0.001$). Thus, it was included in the final model.

The final model included the relations of child maltreatment reports with parenting and the presence of report before T2 (see Figure 11). The presence of reports before T2 remained a significant factor that was linked to the number of child maltreatment reports after T2 across groups; when participants had reports before T2, they were more likely to have more reports after T2 ($\beta = 0.666$; $\Delta\chi^2(1, n=508) = 9.385, p = 0.002$). The nested model comparison that tested whether the association between parenting and child maltreatment report was different across groups revealed that depression trajectory groups showed different associations between parenting and child maltreatment ($\Delta\chi^2(3, n=508) = 23.641, p < 0.001$). To identify the groups that are different, each pair of groups was examined separately. These follow up analyses revealed that *Stable-high depressed* group differed significantly from the other three groups; when mothers were chronically depressed, the number of child maltreatment reports decreased as their parenting improved ($\beta = -2.041$; $\Delta\chi^2(1, n=508) = 27.964, p < 0.001$). On the other hand, when mothers were relatively healthy emotionally at some point, parenting was not related to the

number of child maltreatment reports after T2 ($\beta = 0.432$; $\Delta\chi^2(1, n=508) = 2.462, p = 0.117$).

The parameter estimates of the betas, means, and variances that were included in the structural models with covariates (M1) and in the final structural model (M2) are presented in Table 8.

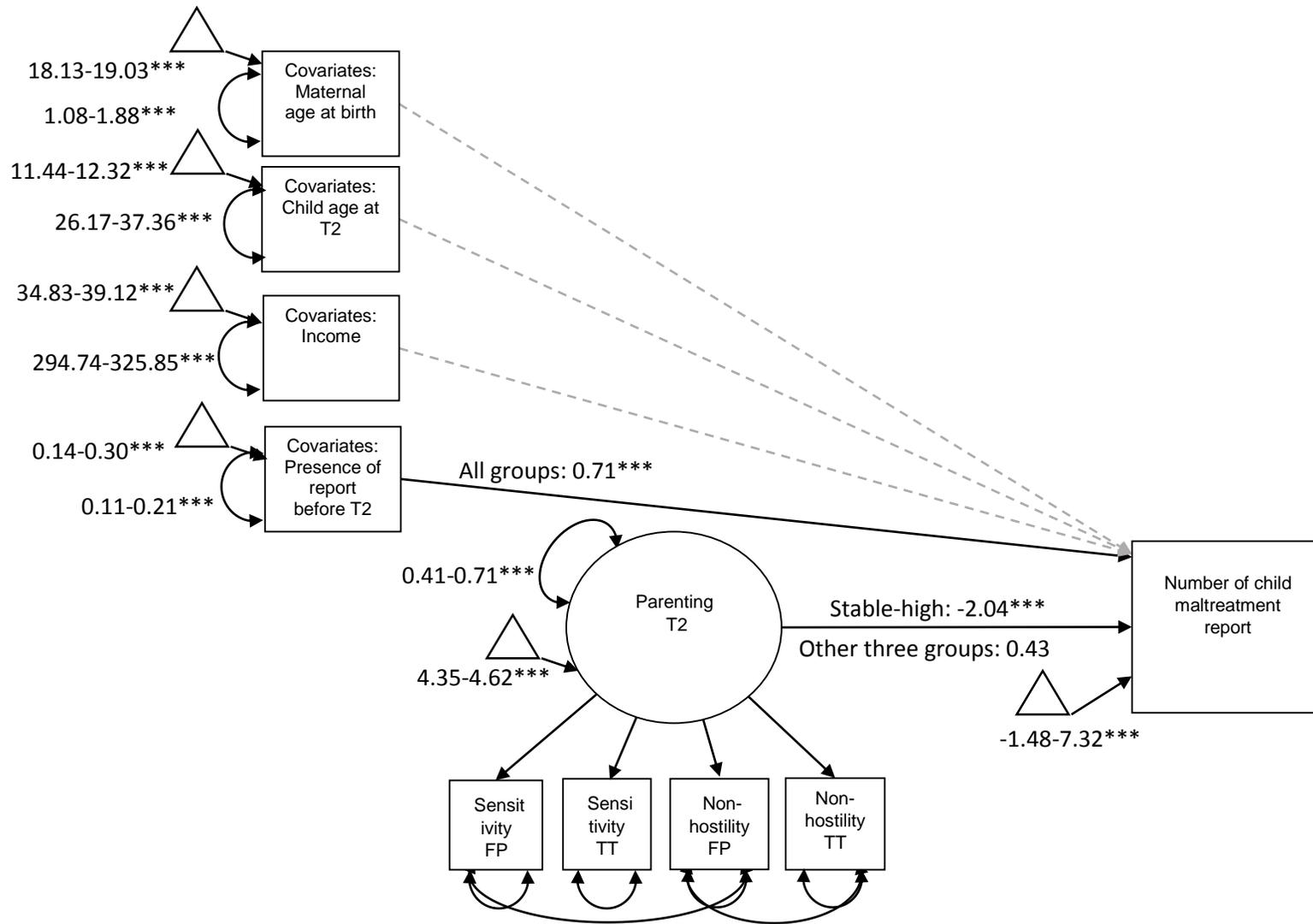


Figure 11. Final structural model that represents the relations between parenting and number of child maltreatment reports, moderated by depression trajectory groups, with covariates (Research question #3).

FP = Free play; TT = Teaching task; T2 = Time 2; Gray, dashed relations indicate insignificant relations not included in the final structural model; Variances and means are represented as a range of estimates across groups; Constructs in circle represent latent constructs and squared constructs denote observed indicators; Triangle indicates means of the constructs.

Research Question 4: Are Selected Protective Factors (Maternal Mentalization, Father Relationship, Home Visitation Program Utilization) Related to Parenting, with Different Associations Across Different Depression Trajectories?

In examining the hypothesized structural models, all of the relations between model variables were included, as well as covariates and their relations with the model variables (see Figure 5-7). Based on the examination of the measurement model, factor loadings and indicator means of parenting and mother-father relationship factors were equated across groups. Other model indicators, covariates, and relations between them were freely estimated across groups. Structural models with the covariates were first tested (M1), then the final structural model was tested (M2). Because similar findings were found for covariates across the examinations of models for each protective factor, the findings for covariates (M1) were presented collectively first, followed by findings for each protective factors in final structural model (M2).

Covariates. The nested model comparisons of Model 1 revealed that maternal age at birth and income did not contribute significantly in predicting parenting. Thus, their relations with the outcome were excluded from the final models. A child's age at T2 contributed significantly in predicting parenting across all groups ($\Delta\chi^2(1, n=508) = 9.6-12.49, p = 0.001$); the older the child was at T2 research interview, the more emotionally available the mothers were during interactions with their children ($\beta = 0.024-0.028$). Thus, the relation between child's age at T2 and parenting was included in the final model (M2), equated across groups.

The presence of report before T2 was significantly associated with parenting across all groups ($\Delta\chi^2(3, n=508) = 4.38-6.39 p = 0.011-0.068$). The presence of reports before T2 was related to higher emotional availability ($\beta = 0.255-0.295$). Thus, the relations between the

presence of report before T2 and parenting was included in the final model (M2), equated across groups. See Tables 9 through 14 for details on model fit statistics of M1.

Maternal mentalization. Based on the model fit statistics, the hypothesized final structural model was a good fit, $\chi^2(135, n=508) = 179.353, p=0.006$, RMSEA = .051_(.028-.07), TLI/NNFI = 0.865, CFI = 0.908, indicating an adequate structural representation of the data. Therefore, the hypothesized structural model was considered the final structural model in this study. The nested model comparison revealed that depression trajectory groups showed no difference in the association between maternal mentalization and parenting ($\Delta\chi^2(3, n=508) = 3.169, p = 0.366$). Furthermore, maternal mentalization was not significantly associated with parenting across groups ($\Delta\chi^2(1, n=508) = 0.606, p = 0.436$). A child's age at T2 and the presence of reports before T2 remained significant predictors of parenting. These analyses revealed that older child's age at T2 ($\beta = 0.027; \Delta\chi^2(1, n=508) = 8.224, p = 0.004$) and the presence of reports before T2 ($\beta = 0.277; \Delta\chi^2(1, n=508) = 8.224, p = 0.049$) were linked to higher emotional availability of mothers. The parameter estimates of the betas, covariances, means, and variances that were included in the structural models with covariates (M1) and in the final structural model (M2) are presented in Figure 12 and in Table 15.

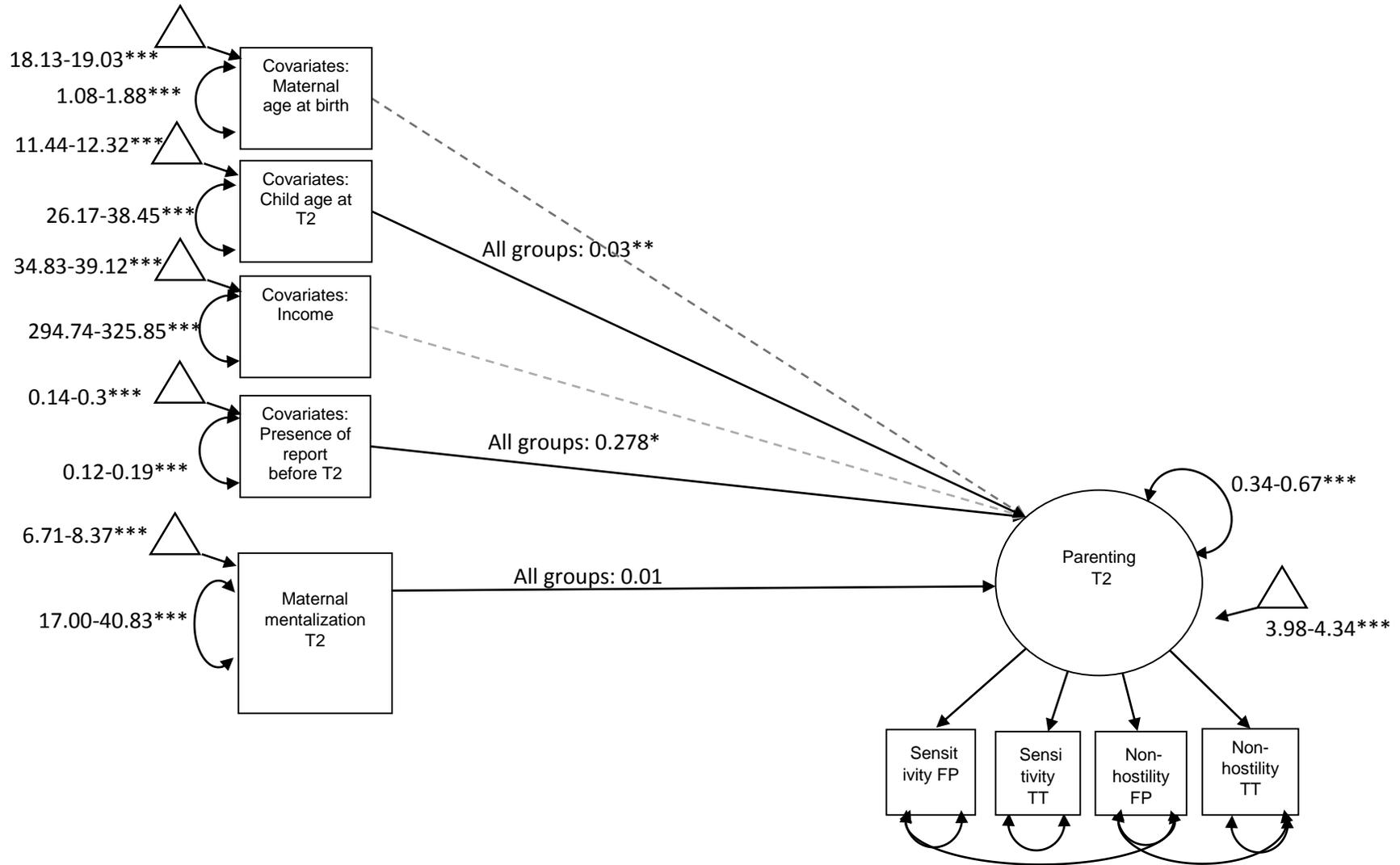


Figure 12. Final structural model that represents the relations between maternal mentalization and parenting across depression trajectory groups, with covariates (Research question #4).

FP = Free play; TT = Teaching task; T2 = Time 2; Gray, dashed relations indicate insignificant relations not included in the final structural model; Variances and means are represented as a range of estimates across groups; Constructs in circle represent latent constructs and squared constructs denote observed indicators; Triangle represents means and intercepts of the constructs/indicators.

Mother-father relationship. Based on the model fit statistics, the hypothesized final structural model was a good fit, $\chi^2(215, n=508) = 302.607, p=0.001, RMSEA = .057_{(.041-.071)}$, TLI/NNFI = 0.918, CFI = 0.938, indicating an adequate structural representation of the data. Therefore, the hypothesized structural model was considered the final structural model in this study. The nested model comparison revealed that depression trajectory groups showed no difference in the association between mother-father relationship and parenting ($\Delta\chi^2(4, n=508) = 5.135, p = 0.274$). Furthermore, mother-father relationship was not significantly associated with parenting ($\Delta\chi^2(1, n=508) = 3.029, p = 0.082$). A child's age at T2 and the presence of reports before T2 remained significantly associated with parenting. These analyses revealed that older child's age at T2 ($\beta = 0.028; \Delta\chi^2(1, n=508) = 9.129, p = 0.003$) and the presence of reports before T2 ($\beta = 0.334; \Delta\chi^2(1, n=508) = 5.506, p = 0.019$) was associated with higher emotional availability of mothers. The parameter estimates of the betas, covariances, means, and variances that were included in the structural models with covariates (M1) and in the final structural model (M2) are presented in Figure 13 and in Table 16.

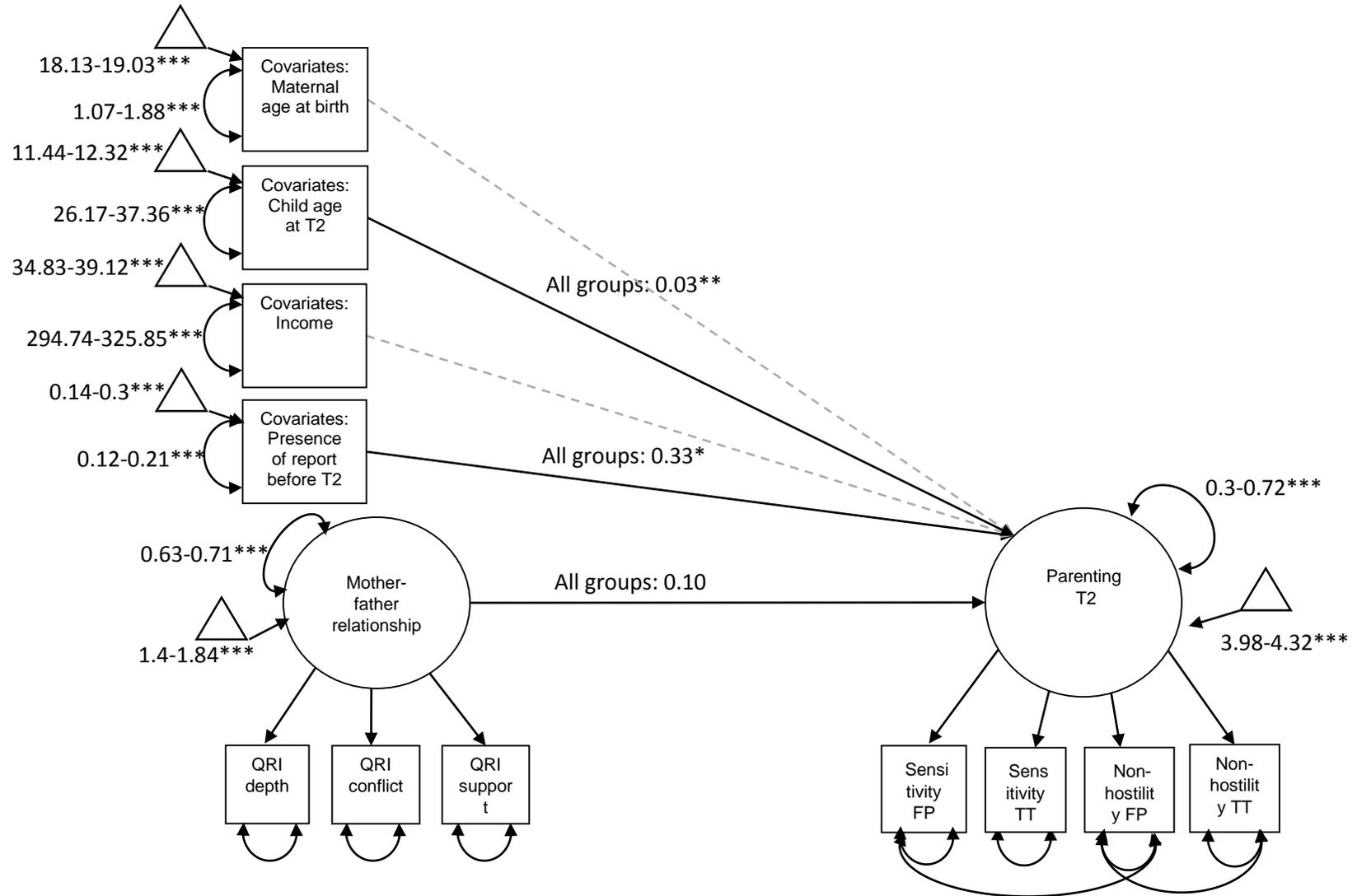


Figure 13. Final structural model that represents the relations between mother-father relationship and parenting across depression trajectory groups, with covariates (Research question #4). QRI = Quality of Relationship Inventory; FP = Free play; TT = Teaching task; T2 = Time 2; Gray, dashed relations indicate insignificant relations not included in the final structural model; Variances and means are represented as a range of estimates across

groups; Constructs in circle represent latent constructs and squared constructs denote observed indicators; Triangle represents means and intercepts of the constructs/indicators.

Home visitation program utilization. Four indicators of program utilization were examined separately, but the findings will be presented collectively as they yielded similar results. Based on the model fit statistics, the hypothesized final structural model was a good fit for all indicators of program utilization, indicating an adequate structural representation of the data (see Table 11 - 14). Therefore, the hypothesized structural model was considered the final structural model in this study. A child's age at T2 remained significantly associated with parenting in the four models modeling each indicators of program utilization; older child age at T2 was related to higher rating of emotional availability ($\beta = 0.026-0.027$; $\Delta\chi^2(1, n=508) = 3.94-10.16, p = 0.001-0.005$). Presence of reports before T2 was significantly related to the higher rating of emotional availability, but this was only the case for the model examining the number of groups ($\beta = 0.283$; $\Delta\chi^2(1, n=508) = 4.053, p = 0.044$).

The nested model comparison that tested whether the associations of parenting with the number of groups, program intensity, duration, and the number of home visits were different across groups revealed that depression trajectory groups showed no difference in such associations. Furthermore, the number of groups and program intensity were not significantly associated with parenting (see Table 11 through 13).

The nested model comparison that tested whether the association between parenting and the number of home visits revealed significant associations ($\Delta\chi^2(1, n=508) = 3.938, p = 0.047$). More home visitations received between program enrollment and T2 phone interview was associated with lower scores of emotional availability ($\beta = -0.01$). Similarly, the association between the duration of program enrollment and parenting was significant; longer duration in the program between enrollment and T2 phone interview was associated with lower scores on emotional availability ($\beta = -0.02$; $\Delta\chi^2(1, n=508) = 5.274, p = 0.022$). The parameter estimates of

the betas, means, and variances of that were included in the structural models with covariates (M1) and in the final structural models (M2) are presented in Figure 14 and in Table 17 through 20.

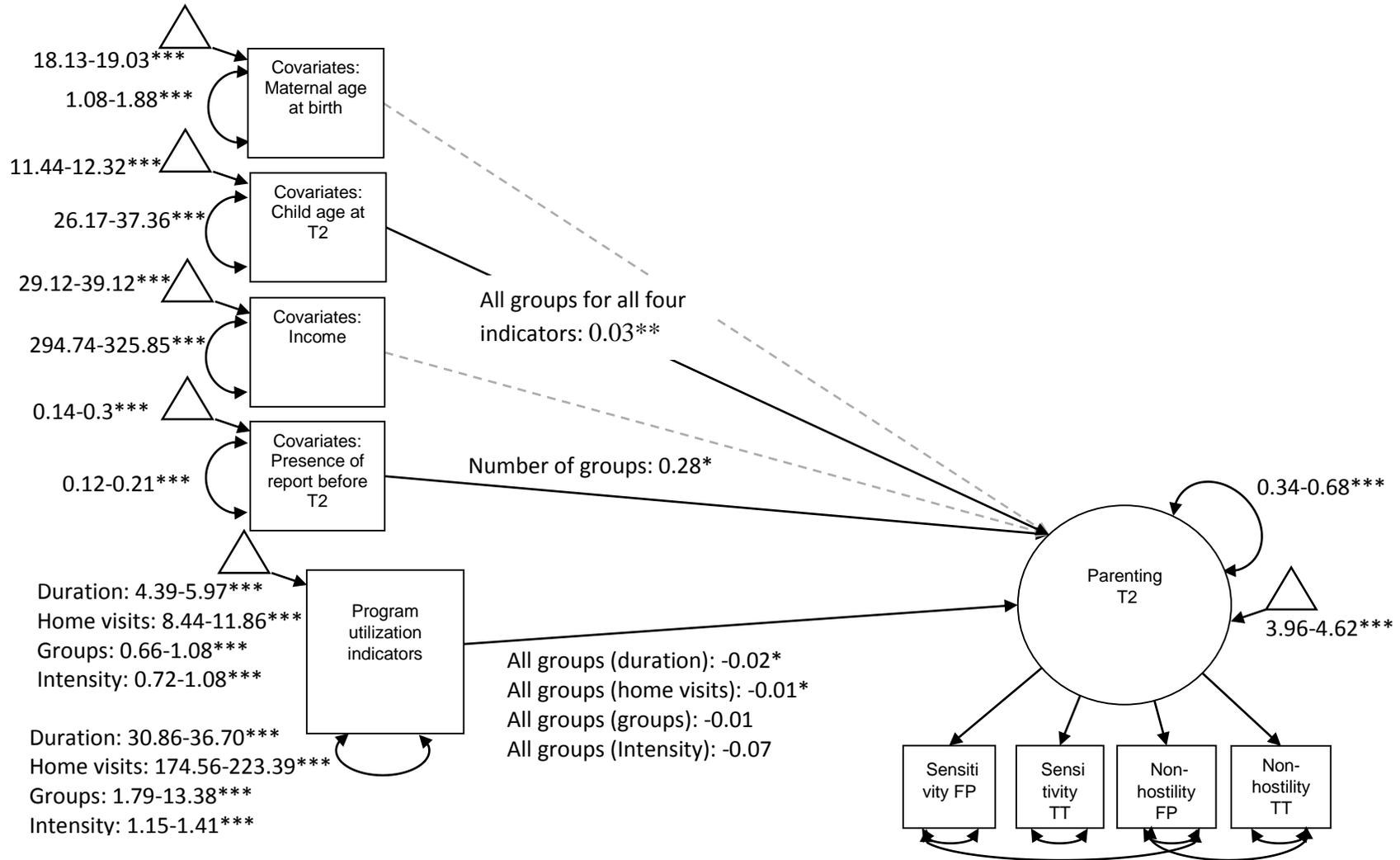


Figure 14. Final structural model that represents the relations between program utilization indicators and parenting across depression trajectory groups, with covariates (Research question #4).

FP = Free play; TT = Teaching task; T2 = Time 2; Program utilization indicators are number of home visits, duration of program enrollment, number of groups, and program intensity (home visits per month); Gray, dashed relations indicate insignificant relations not included in the final structural model; Variances and means are represented as a range of estimates across groups and program

indicator models; Constructs in circle represent latent constructs and squared constructs denote observed indicators; Triangle represents means and intercepts of the constructs/indicators.

CHAPTER FIVE: DISCUSSION

Maternal depression and child maltreatment are serious public health concerns that can impact the life trajectories of families and children in the U.S. Mothers who experience depression often exhibit diminished ability to provide adequate care for their children and put children at risk for child abuse and neglect (NRC & IOM, 2009; Silver et al. 2006). When maternal depression is experienced chronically at a clinical level with an early onset during a child's infancy and early childhood, mothers are more likely to engage in neglectful, aggressive and hostile parental behaviors and children face developmental complications (Ammerman et al., 2009; Bureau et al., 2009). Adolescent mothers, in particular, experience an elevated prevalence of maternal depression and child maltreatment, bringing added concerns to the developmental outcomes of their children (Mollborn & Morningstar, 2009; Tzilos et al., 2012; Whitman et al., 2001).

Although maternal depression is a common risk factor for child maltreatment, the direct link between maternal depression and child maltreatment has not been consistently established (Choi et al., 2010; Zuravin et al., 2005). Maternal depression is often chronic and persistent (Ammerman et al., 2009) and factors associated with child maltreatment are multifaceted (IOM & NRC, 2013). Furthermore, some adolescent mothers exhibit positive parenting in the presence of depression (Easterbrooks et al., 2010). Given the complexity of the association between maternal depression and child maltreatment, this study aimed to dissect and better understand maternal depression and child maltreatment by investigating longitudinal trajectories of depression among adolescent mothers and exploring the links between early parenting and child maltreatment. This study also examined selected protective factors – maternal mentalization, mother-father relationship, and use of home visitation program – that may promote positive

parenting among mothers experiencing different trajectories of maternal depression. The findings of the study revealed that adolescent mothers experience depression at different rates, and the relation between maternal depression and child maltreatment is multi-dimensional, in which early parenting and the role of formal support through home visitation should be considered in conjunction with family's history of child maltreatment when promoting positive parenting and preventing child maltreatment among young mothers.

Variability in the Experience of Maternal Depression

GMM analysis revealed five patterns of maternal depression trajectories: Stable-non depressed, Stable-low depressed, Stable-high depressed, Increasing and Decreasing. Mothers in these groups exhibited similar demographic characteristics; most of them were pregnant at study enrollment and majority were non-Hispanic White or Hispanic, residing, on average, in lower income neighborhoods. They had fluid romantic relationships and many were no longer involved with the father of the baby at the end of the study. Mothers across depression trajectory groups showed, on average, inconsistent emotional availability, limited satisfaction with the relationship with the fathers of their babies, and showed similar patterns in their use of the home visitation programs.

They also exhibited some differences. Mothers in the *Stable-high depressed* group were younger at study enrollment and at first birth and were more likely to be enrolled in high school than mothers in the other groups. Mothers who exhibited depression at early stage of the study (*Stable-high depressed* and *Decreasing*) reported more conflicts than other mothers who were relatively healthy emotionally at earlier time points (*Stable-non depressed*, *Increasing*, *Stable-low depressed*).

While a little more than half of mothers never experienced depression at a clinical level across the first few years of their children's lives, close to half of the participating mothers experienced depressive symptoms at clinical level at one point, with 8% of mothers experiencing the symptoms chronically at a clinical level. It is quite alarming that close to half of the mothers have experienced clinical levels of depression at some point during their pregnancy or their children's infancy, given the serious consequences associated with maternal depression (Ammerman et al., 2010; Field et al., 2009; NRC & IOM, 2009). The heightened concerns for the persistence of maternal depression is further evidenced by the severe level of depressive symptoms exhibited by these mothers. While severity itself may not impact mothers' parenting (Leadbeater et al., 1996; Lesser & Koniak-Griffin, 2000), experiencing maternal depression chronically at a severe level may be especially detrimental to young mothers' parental functioning.

These numbers, however, are not surprising as adolescent mothers show a high prevalence (as high as 60%) of maternal depression during the early years of postpartum (Lanzi et al., 2009; Wang et al., 2011) and face various risk factors that are associated with chronic experiences of maternal depression (Horwitz et al., 2009). It is also consistent with a previous report of depression prevalence among a similar group of adolescent mothers (Jacobs et al., 2005), but Jacobs et al. (2005) reported higher percentage of mothers (27% vs 8%) with chronic and severe depression. Given the recent attention on maternal mental health in the field, service providers are more aware of prenatal and postnatal depression and treatments may be more accessible for these mothers at this time despite the ongoing struggle to provide treatments to these mothers with mental health challenges. What is critical to understand here is that maternal

depression is still a prominent factor present in the lives of many adolescent mothers and their children, and the experience of depression is quite heterogeneous.

Beyond the Effects of Maternal Depression

While the patterns of maternal depression trajectories found in this study present heterogeneity of depression experienced by adolescent mothers, the analyses also suggest more complex ways in which maternal depression influences how mothers handle newly obtained role of parenthood and related stressors in their lives. The multigroup negative binomial regression revealed that the occurrence of child maltreatment after a child is about a year old did not differ across depression trajectory groups, and most of the participants had no reports of child maltreatment. It is possible that physicians and pediatricians who are involved in the early postpartum period with the family may be more aware of potential early maternal depression and its consequences, and are able to address the symptoms and possible impact on parenting. The persistence of depression may become more detrimental at a later perinatal stage, when such awareness and attention may fade as the frequencies of doctor visit drops.

This finding could also suggest that for adolescent mothers in this sample, the presence (or absence) of depression itself may not pose a strong link to child maltreatment during the first years of parenthood (Kinard, 2003). That said, 23% of the participants did become involved with the child welfare system at least once, regardless of whether the reports filed were supported, and re-reporting of child abuse and neglect are not uncommon during the first six years of childhood (Proctor et al., 2012; Putnam-Hornstein et al., 2014). The presence of cumulative risks, rather than one risk factor, is thought to trigger the onset of child maltreatment (Begle et al., 2010; Nair et al., 2003), and adolescent mothers often face various risk factors that are associated with chronic experiences of maternal depression (Horwitz et al., 2009).

Therefore, it may be the cumulative nature of risk factors (e.g., being a teenage mother, being depressed, low income) rather than individual contribution that may be more detrimental to adolescent mothers' parenting and, given the changing circumstances of these mothers and their children's lives and the persistent nature of depression, we must continue to consider the potential long term impact of persistent depression as children grow.

Given the multifaceted nature of factors associated with child maltreatment (Belsky, 1993; Spieker et al., 2001), the current study findings could allude to the importance of multiple contexts that may contribute to child maltreatment. That is, maternal depression may not be a sole contributor to child maltreatment, and may not be a vulnerability when other supports are present. Alternatively, maternal depression may act as an underlying factor that makes a mother vulnerable to such maladaptive parenting behaviors when other stressors are present. In fact, the variability in how and when mothers experience depression may change the constellation of other contextual factors that may influence parenting. Such heterogeneity in conjunction with other stressors may explain why some have difficulty parenting during their depressive episodes, engaging in harmful behaviors, while some can exhibit positive parenting in the presence of their depression. It then becomes critical to examine how such variability in depressive symptoms, in combination with other contextual factors, may express its effect on the occurrence of child maltreatment and mothers' parenting, and this study revealed a more nuanced link between maternal depression trajectories, early parenting, and child maltreatment.

Early Parenting as a Precursor to Child Maltreatment

Establishing effective parenting in a child's early years is considered a critical building block for establishing subsequent positive mother-child interactions and relationships (Dukewich, Borkowski & Whitman, 1996; Lounds et al., 2006). Not only is it influential to

children's development (National Scientific Council on the Developing Child, 2007; Shonkoff et al., 2009), but it may also set a foundation for how parents decide on their childrearing strategies. When a mother and a child have already established an interactive style that is dysfunctional, a mother may not be able to practice effective parenting skills, perpetuating the cycle of this dysfunctional interactive style (Tronick, 2006). In fact, such dysfunctional parenting and interactive style is theorized to result in child maltreatment, when other contributing stressors are present in family's developmental context (Belsky, 1993; Afifi, 2007). The finding of this study speaks to this very nature of perpetuating influence of parenting, where parenting at T2 was a significant factor associated with the occurrence of child maltreatment after T2. That is, mothers' higher emotional availability at T2 was related to fewer subsequent reports of child maltreatment; this was the case for the *Stable-high depressed* group, but not for other depression groups. This finding highlights chronic depression experienced early in parenthood as an underlying risk factor, which may push mothers who are not emotionally available to engage in abusive and neglectful acts, but also as a factor with an effect that could be circumvented with an engagement in a positive parenting behaviors during the early infancy years.

The finding can also be examined in relation to the types of child maltreatment. Although this study did not differentiate child abuse and neglect, the majority of the reports filed involved neglect (97.5%). Thus, the finding of this study may be more relevant to child neglect than abuse. Each form of maltreatment is considered to have distinct mechanism of etiology (Chaffin et al., 1996), and available studies have found mixed results in the role of maternal depression in predicting child physical abuse and neglect (Bartlett et al., 2013; Chaffin et al., 1996; Kohl et al., 2011; Mustillo et al., 2011; Zuravin & DiBlasio, 1996). The current finding supplements the understanding of the role that maternal depression plays, and the lack of group

differences in the number of child maltreatment reports may suggest that maternal depression itself may not be a risk factor that triggers child maltreatment, especially child neglect. That said, the significant relation found between parenting and child maltreatment among chronically depressed mothers may suggest that when symptoms are experienced chronically at severe level, the presence of maternal depression may become a vulnerability to engage in child neglect for young mothers who is limited in their parenting skills, in this case, emotional availability.

Furthermore, young mothers in this sample exhibited inconsistent sensitivity, with both responsiveness and intrusiveness (e.g., lack of engagement and positive affect), while showing minimal hostility (e.g., impatience, frustration). Women are also thought to exhibit and be at a greater risk for internalizing problems than externalizing problems (Eaton et al., 2012; Leadbeater, Kuperminc, Blatt & Hertzog, 1999), and mothers engaging in neglectful parenting present less engagement in childrearing and less empathy (Shahar et al., 2001; Slack et al., 2004). Thus, young mothers in this study may have exhibited more symptoms of internalizing problems and parenting behaviors more relevant to child neglect, which may have contributed to the number of child maltreatment reports filed after T2. This interpretation requires further investigation that takes into account the different symptoms of depression, alternative measurements of parenting, and assessment of each type of maltreatment.

The finding also emphasizes the concept of resilience among young mothers. Adolescent mothers who were chronically depressed may have fought against their risk of perpetrating maltreatment, and their competence in engaging in emotionally available behaviors with their children may have acted as a protective factor that modified the otherwise negative effects of them being chronically depressed (Cicchetti & Toth, 1995; Luthar et al., 2000). The lack of the link between parenting and child maltreatment among mothers who were relatively healthy

emotionally at some point during their child's infancy is also indicative of early positive parenting being a factor that may help promote positive adaptation within the context of adversity. Thus, prevention work becomes necessary in promoting positive maternal behavior early in parenting for the most vulnerable population.

Furthermore, most of the mothers (75%) in the *Stable high-depressed* group were pregnant at enrollment and at T1, and maternal depression experienced as early as during pregnancy can amplify its detrimental effect on mothers and children (Deave et al., 2008; Field et al., 2006; Goldstein et al., 1996; McLearn et al., 2006; Milgrom et al., 2008; Pacheco & Figueiredo, 2012). Thus, the experience of chronic depression among young mothers may be particularly concerning, unless young mothers are able to exhibit nurturing and sensitive interactive skills. Indeed, it will be a challenge to engage mothers who are chronically depressed as they are the most vulnerable and most difficult to reach (Ammerman et al., 2010). However, to engage these mothers is a critical and perhaps most worthwhile of all challenges, as they may show the most benefits from engaging in prevention efforts. Furthermore, programs that aim to promote positive parenting show limited effectiveness in identifying and addressing depression, and the experiences of untreated depression pose severe consequences on long term maternal functioning and child outcome (Ammerman et al., 2010). While this study provides evidence for the resilient parenting functioning among chronically depressed mothers, given the concern for long term impact of chronic maternal depression (Easterbrooks et al., 2010; Foster et al., 2008), such preventative efforts must also consider augmenting programs with components, such as in-home cognitive behavioral therapy, that specifically target the reduction of depression.

It was unexpected to find no associations between parenting and child maltreatment among mothers who were not chronically depressed and who were relatively healthy emotionally

at one point during two-year course of the study. Based on previous theoretical and empirical work (Afifi, 2007; Belsky, 1993; Munz et al., 2010; Slack et al., 2004), I expected to see a significant relation between parenting and child maltreatment, but at a lesser degree, as chronically depressed mothers may gain the most from positive early experiences in parenting. The finding suggests that these groups of mothers may be operating under different rules, and several factors relevant to adolescent parenting could be considered.

First, consistent with the resilience framework, the fluctuation in parenting for relatively healthy groups may not have been enough to yield an outcome, given the lack of “emotional adversity” (i.e., chronic depression). The average means and standard errors of the parenting construct were similar across groups, which indicate that mothers in different groups showed similar range of emotional availability, and the variability in the emotional availability scores was small. The mothers in the sample also exhibited, on average, inconsistent emotional availability ($M = 4.57-4.83$) with relatively limited hostility ($M = 3.95-4.26$); that is, mothers were able to respond to their children’s needs appropriately and sensitively and showed minimal hostility toward their children, but also exhibited intrusiveness and negative engagement with their children. Thus, young mothers in all the depression groups in general were not highly emotionally available. However, the degree in which emotional availability changed may have yielded a different consequences for different depression groups. That is, a little improvement in parenting (mothers exhibiting sensitivity and patience, but still exhibiting some preoccupation with her own agenda) may have gone a long way for mothers who were chronically depressed, leading to fewer child maltreatment reports. On the other hand, for mothers who did not experience depression at chronic and clinical level, a similar improvement may not have been significant to influence their engagement in child maltreatment at later times. According to

resilience framework, a factor that modifies negative effects of risks into positive direction would only operate under the presence of adversities (Cicchetti & Teti, 1995; Luther et al., 2000). Thus, when chronic and severe nature of depressive symptoms are absent, the impact of improved emotional availability present for chronically depressed mothers may become absent for other mothers who did not experience depression chronically.

It is also possible that parenting is simply not what predicts child maltreatment for these mothers, and other factors may be playing a more prominent role. Given the multifaceted nature of contexts that adolescent mothers live in, the contextual constellation in which the presence (or absence) of maternal depression and contextual factors create may pose different power to early parenting. In fact, the present investigation found that the presence of child maltreatment during a child's first year to be a strong predictor for child maltreatment for mothers who were relatively healthy emotionally, as well as for mothers who experienced depression chronically, calling for the importance of prevention at early stages of children's lives.

Early Intervention as a Critical Act for Child Maltreatment Prevention

The goal of many child welfare agencies is to eliminate harmful acts on children and to prevent the recurrence of such harmful behaviors. Despite the overall decline in the rate of child maltreatment, as high as 67% of the cases are referred back into the child welfare system across children's lifetimes (English et al., 1999; Connell et al., 2007; Drake et al., 2003; Proctor et al., 2012; Putnam-Hornstein et al., 2014). In fact, child neglect exhibits relative stability in its rate (US DHHS, 2015). Often times, these repeated offenses occur right after their first involvement with the child welfare system (English et al., 1999; Hindley, Ramchandani & Jones, 2006), and the intervals between reports get shorter as the number of prior reports increases (Marshall & English, 1999). Parents of younger children are at a higher risk for repeated involvement, and

many of these children end up being placed in foster care system or adopted (Fluke, Yuan & Edwards, 1999).

The finding of this current investigation parallels our current understanding of recidivism; the presence of reports before T2 (during a child's first year) was significantly associated with the higher number of reports filed after T2. Many factors related to initial involvement in child maltreatment is also predictive of maltreatment recidivism (Kohl et al., 2011a; Kotch et al., 1997), which suggests that if families have already experienced being reported due to multiple risk factors in their living contexts, they might be more prone to engaging in behaviors that may put their children in harm, unless these risk factors are alleviated or diminished by protective factors. For adolescent mothers, their incomplete development of frontal cortex may cause them to be more self-absorbed, lacking self-control, and relatively unaware of the consequences of their actions (Casey, Jones, & Hare, 2008; Johnson, Blum & Giedd, 2009; Steinberg & Scott, 2003). Thus, young mothers may be more vulnerable to engaging repeatedly in behaviors that may put their children at harm when opportunities arise. Such challenges may be a stronger factor for mothers who are relatively healthy emotionally than mothers who are chronically depressed because they may be less inclined to rely on others to care for their children and are more able to engage in other activities, perhaps risky and inappropriate, allowing for more opportunities to be visible in the society and attract attention from the welfare system and law enforcement agencies. The study finding also reiterates that both substantiated and unsubstantiated reports are likely to be repeated, and the fact that the majority of the reports in this study were comprised of neglect further confirms the need of more liberal consideration of including factors other than supported allegations to fully understand and capture the accurate representation of child neglect.

Furthermore, the initial involvement in the child welfare system may yield monitoring and surveillance, which may attract more eyes from the services for their future actions. Such monitoring and surveillance not only increases the chance of subsequent reports being filed, but may also explain the current study finding, where the presence of reports before T2 was associated with the higher scores of emotional availability at T2. As people become more involved in helping these mothers engage in positive parenting, mothers may be more likely to be involved in some services that help them improve their parenting skills. Such involvement of services may need to be long term, as the presence of reports before T2 still increased the chance of engaging in maltreating behaviors later on for these young mothers. Thus, unless we can prevent maltreatment from happening during the first year, adolescent mothers may continue to be at risk for subsequent maltreatment, even if they are able to improve and provide adequate care for their children at particular moments. This necessitates early involvement of programs, especially before children turning one, and intensive effort on the prevention of child maltreatment of younger children.

One way to sustain positive parenting and prevent child maltreatment may involve reconsidering the role of protective factors that may be unique to adolescent mothers. Interestingly, this study found that the presence of reports before T2 was not always associated with positive parenting; it depended on which variables were included in the model. What this means is that statistically, the variances of the outcome variable (parenting) was already explained by other predictors in the model, and that the presence of reports before T2 may become obsolete, if variables more prominent in explaining positive parenting were included, making it even more critical in finding what unique protective factors promote positive parenting

among this group of adolescent mothers, particularly in the presence of past child maltreatment reports.

Reconsidering the Role of Protective Factors

Maternal mentalization. The recent expanded focus on a mother's proclivity to mentalize and act accurately upon a child's inner state has helped unlock another critical dimension that could help us further understand the impact of a mother's own attachment experiences and her thought processes on her parenting and interaction with her child (Sharp & Fonagy, 2007; Slade, 2005). Studies have suggested maternal mentalization as a prerequisite quality for a mother to respond and interact with her child in a developmentally appropriate manner (Lundy, 2003; McMahon & Meins, 2012). In particular, successful development of an adolescent mother may be dependent, in part, on her preparedness to parent, and her cognitive maturity to parent is considered a vital ingredient for effective parenting that is unique to adolescent parenthood (Afifi, 2007; Applegate & Shapiro, 2005; Schellenbach et al., 1992). Thus, a young mother's ability to mentalize her child's mental state appropriately may be one of the cognitive maturity that promotes her positive parenting.

Unfortunately, the multi-group structural model analysis in the current study did not find this to be true for adolescent mothers; there was no significant relation between maternal mentalization, operationalized by mind-mindedness, and parenting across different depression trajectory groups. In fact, mothers in the sample, regardless of their depression status, used little appropriate comments (7.63% of total number of comments) that reflected their capacity to mentalize and recognize their children's mental state in an appropriate manner. This finding parallels the findings of Demers and colleagues (2010), where being mindful of their children's mental states was not beneficial for adolescent mothers' sensitivity toward their children.

Given that the use of any mind-related comments in general also was limited (8.4%) in this study sample, the lack of evidence may suggest that maternal mentalization is less relevant for young mothers' parenting given their nature of incomplete cognitive development and lack of experiences in childrearing. The limited use of appropriate mind-related comments suggest that the concept of "mentalizing" a child's mental state may be a complex thought process that requires a more intricate cognitive processes, which adolescent mothers are yet to develop. Thus, regardless of their mental health status, young mothers in general tend not to use mindful comments, which limits the variability of such behaviors in this adolescent mother population, making mentalization a less relevant factor for young mothers' parenting. Furthermore, adolescent mothers face multiple risk factors that may affect their parental behaviors. Thus, maternal mentalization may not be a factor that could uniquely outweigh the other contextual factors influencing their interactions with their children. That said, the prevalence of mind-related comments used by these adolescent mothers was no different from adult mothers (Meins, Fernyhough, Arnott, Turner & Leekam, 2011). Thus, adolescent mothers may not necessarily lack the ability to mentalize, but rather, the concept of mentalization may still not be relevant for these young mothers, who are still developing themselves, and especially when their children are very young and are receiving sufficient support from their family (e.g., maternal grandmother). Furthermore, when mothers in this study used mind-related comments, majority of these comments were appropriate mind-related comments (93%). Given that mothers' capacity to mentalize their children's inner state is malleable to intervention (Colonnesi et al., 2012; Pajulo et al., 2012; Sadler et al., 2013; Schechter et al., 2006; Stirtzinger et al., 2002), if young mothers are taught the skills to be mindful, then it is possible that such a skill may become a big asset for young mothers.

Mother-father relationship. Although social support from spouse/partner may help alleviate parental stress, promote positive parenting, and impact adolescent mothers who are juggling the dual responsibility of being a parent and a teenager more profoundly, a mere positive support from the father of the baby may not necessarily do the trick. This study found no association between mothers' relationship with the father of the baby and mothers' parenting; there were no differences in the parenting between mothers who reported positive relationship with the father of the baby and mothers who did not. There were also no group differences across depression trajectory groups.

This finding is somewhat unexpected given the importance of romantic relationships for young mothers and her parental functioning (Brunelli et al., 1995; Collins, 2003; Huang & Lee, 2008), but also understandable given their residential and relationship status. Partner relationship tends to elicit its positive effect on mothers who are in stable relationship and residing together with the father of the baby (Contreras, 2004; Kalil & Kunz, 2002). In this study, only about a third of the mothers lived with the father of the baby, and most of them lived with a parental figure. Given their residential status, they may be already receiving support from parental figures, such as maternal grandmother, who may be providing more regular assistance in raising their children than the father of the baby, who tend to be teenager themselves and perhaps lack the appropriate knowledge of childrearing. Furthermore, close to half (47.5%) of the mothers were no longer in a romantic relationship with the father of the baby at T2, and this percentage increased at T3 (61.3%). Therefore, the positive relationship that mothers have with the fathers of the babies may not be relevant to and may not have a direct impact on how mothers parent, when the father of the baby is not consistently present. Rather, parental support from maternal grandmother or pediatrician may be more relevant during early parenting as such

support may be directly beneficial to childrearing. Moreover, support from other parental figures or reliable family members may allow mothers, especially those who are depressed, to have support in caring for their children, which may also relate back to the lack of relation between maternal depression and child maltreatment found in this study. That is, by having the presence of others who are able to provide support for these adolescent mothers and care for their children, these family members may be protecting children from child abuse and neglect before mothers' depression influences the safety of their children.

The mother's satisfaction with the relationship with the father of the baby may also become obsolete if the quality of the relationship and support is not relevant to raising children. A satisfied, good stable relationship with the father of the baby may be critical in reducing life stress, which often leads to better quality of parenting (Brunelli et al., 1995; Gustafsson & Cox, 2012). While half of the mothers were still in a relationship with the father of the baby at T2, mothers rated their relationship with the father of the baby, regardless of their mental health status, as somewhat supportive and satisfying ($M = 1.67$). Furthermore, adolescent romantic relationships tend to be fluid and less committed (Collins, Welsh & Furman, 2009). Thus, mothers may not be expecting much support from the father of the baby, making their relationships with the fathers of their babies less of their focus in life, and making such relationship less relevant when building relationships and interacting with their children. Given the measure used in this study to assess the quality of mother-father relationship was a self-report measure, it may require a more in-depth multifaceted investigation of adolescent mothers' view on partner relationship in relation to parenting to further understand the role of partner support and relationship for young mothers' parenting.

Home visitation. Home visitation is considered an effective approach to reaching adolescent parents and promoting positive parenting among adolescent parents (DuMont et al., 2010; Howard & Brooks-Gunn, 2009; Middlemiss & McGuigan, 2005). The qualities of home visitation programs are critical in achieving the goals of the program (Astuto & Allen, 2009; Olds & Kitzman, 1993), and this study investigated several indicators of the program utilization that were hypothesized to influence the parenting of adolescent mothers. Contrary to many of the study findings, the current investigation found that longer duration and more home visits were associated with poorer scores on parenting. The number of group activities mothers participated in and the intensity in which mothers received the visits per month were not associated with how mothers interacted with their children.

First, it is important to understand that this study investigated program indicators as continuous variables, which meant that the average means of these indicators were lowered with inclusion of mothers who were randomly selected to be in control group and disregarded the random assignment status. This analytical approach also did not determine definite causal effect of program indicators on parenting. However, there are several possible explanations to be considered for the relations found (and not found) in this study.

The non-significant finding of the number of groups and program intensity may be explained by the fact that participants may need to get the full amount of the program to show its effect. This study examined parenting when the child was about a year old, which is around the midpoint of the data collection. Furthermore, among those who received home visits, average group participation was limited across depression trajectory groups, and the rate in which mothers received home visits per month were less than optimal (three visits per months showed optimal program effect; Nievar et al., 2010; Wagner & Clayton, 1999). Therefore, the number of

groups or average monthly number of visits may not have been enough to provide any impact on how parents interacted with their children at T2. Furthermore, the findings of older child age being associated with better parenting may suggest that the developmental stage of the child may be more critical than the actual number of groups mothers participated or how often mothers received home visits monthly. This implication may necessitate a further investigation of the timing of families enrolling into the program and whether a program was involved during critical transitioning period, which are considered critical components of program implementation (Ammerman et al., 2010).

The significant association between longer duration, more home visits and less optimal parenting may suggest the effect of surveillance, which has been evident in other investigations and evaluations with similar sample (Easterbrooks et al., 2013; Mitchell-Herzfeld et al., 2005; TIER, 2014). Mothers who were functioning well may have participated in the program for a shorter period of time and less frequently because they may not have felt the need to do so, and service providers may not have seen the need to enroll them longer with more visits. On the other hand, mothers who stayed longer may be those who need the extra time and support, and home visitors may have seen the need to enroll them earlier and longer with more frequent contacts. This suggests the importance of training home visitors in identifying adolescent mothers with greatest risks and engaging them in the program for consistent and sufficient service delivery.

An alternative interpretation of the current findings may be related to the nature of data collection. Given that the duration was calculated from program enrollment up to T2 data collection, it is possible that mothers who had longer duration in the program may be those who were harder to reach or locate. These mothers often face challenges of juggling tasks and

appointments and perhaps have more trouble parenting due to those existing challenges. Such difficulty in accessing families at T2 may extend the duration of program enrollment examined, which could explain the significant association between longer duration and less optimal parenting. This again aligns with our understanding that highly dysfunctional families may be those who need to be enrolled in support programs with effective monitoring.

This finding can also shed light into considering the most appropriate duration of program and number of home visits in conjunction with the developmental stages and the needs of families and children. The current finding of an older child's age being associated with more appropriate parenting suggests that when their children are older, young mothers are able to provide sensitive parenting and interact with their children appropriate, regardless of whether they were receiving home visitation or not. Given that early experiences shape children's later development, targeting service provision at very young age, perhaps the first year, may be the time most in need that yields most benefit for young mothers and their children.

Study Limitations

Several limitations should be considered as future studies further investigate the link between maternal depression, parenting, and child maltreatment among adolescent mothers. First, sample characteristics should be considered carefully. The analysis of this study was limited to a self-selective group of adolescent mothers who expressed interest in receiving home visiting services and agreed to participate in evaluation. Furthermore, they also agreed to additional home interviews at either T1 and/or T2. Specifically to the analysis of program utilization, the sample was examined on the basis of the receipt of the services, rather than based on the randomized assignment to the treatment status performed in the original evaluation study. Therefore, participants might have pre-existing differences such as having less contextual

obstacles in their lives that allowed them to seek and participate in an evaluation and receive services, which may limit the generalization of the study findings to young mothers who are interested and able to engage in support services.

Furthermore, the findings of the current investigation are specific to first-time adolescent mothers with infants. Thus, we cannot generalize to older mothers or adolescent mothers with older children or who have multiple children. Nonetheless, there is a value to the current investigation as these mothers in this study may be at high risk for maladaptive parenting, but also most susceptible to interventions. Thus, this study could provide critical information in developing effective prevention programs that may keep these first-time adolescent mothers from engaging in harmful behaviors that put children at risk for developmental complications.

Another sample limitation is that some participants had attrited during the data collection. Although FIML was employed and is accepted as one of the optimal ways of dealing with missing data, we need to interpret the findings with caution. One solution would be to investigate and control for factors that may differentiate mothers who participated in the home interview from ones who attrited and/or declined to participate in the home interview. Another option would be to employ a planned missing data design, which “allows researchers to collect incomplete data from participants by randomly assigning them to having missing items, missing measurement occasions, or missing measures” (Little & Rhemtulla, 2014, p. 199). Each data collection would be carefully designed to include variables most likely to be associated with missingness, which allows recovering of the missing data (Little, 2013). For instance, a researcher may create form A and form B with different items of a depression measure. Participants are randomly assigned to answer one of the forms, but both forms contain common items that may be strongly related to nonresponse or attrition. This approach allows less burden

on participants by shortening the assessment, more items included in the study, and reduce the cost of data collection, which improves the quality of the data, the breadths of constructs examined, and the amount of missingness recoverable from the observed data (Little & Rhemtulla, 2014).

Analytical limitations should also be considered. First, the onset of depression and the experiences of depression can vary depending on numerous contextual factors including pregnancy status of mothers. It is suggested that the number of pregnancy or miscarriages and the period between the last trimester of pregnancy and first few months postpartum to be highly correlated to the onset of depression (Cox, Murray & Chapman, 1993; Figueiredo & Conde, 2011; Wisner et al., 2013; Yozwiak, 2010). Unfortunately, this study did not take into account mothers' pregnancy status (e.g., how far along in pregnancy, number of pregnancies before first birth) that may influence the nature of depressive symptoms experienced by these mothers. Furthermore, given the timing that measures were assessed, it is not possible to examine the associations of the variables explored in the current study with definite causal effect in mind. That said, theoretical frameworks pertinent to maternal depression, adolescent parenthood, and child maltreatment have suggested directions of the relations between variables, allowing me to consider early parenting as a precursor to child maltreatment, and protective factors as vehicles that promote early positive parenting, yielding further understanding of the links between maternal depression, adolescent parenthood, and child maltreatment.

While providing additional facets of information to the field of home visitation, the continuous variables of program utilization indicators were analyzed based on the receipt of services and included mothers from the control group, which violated the element of randomized controlled trial and hid the true program effect on parenting. Not adhering to the random

assignment can also create sample bias that can affect the interpretation of the outcomes (Mitchell-Herzfeld et al., 2005). The program indicators were also only measured up to T2 data collection, so the nature of program usage was not fully captured for the entire period that mothers were expected to be enrolled (prenatally to a child's third birthday). Thus, the significance of program utilization indicators was only partially examined. As Sweet and Appelbaum (2004) suggested, no one program characteristic does the trick in improving parental and child outcomes. Thus, future studies should consider using program utilization profiles that portray different facets of home visitation in some combination, which may fully capture how mothers are participating in the program. This approach allows adherence to the randomized controlled trial and minimizes sample bias by including mothers in the treatment group who received no services as still being part of the treatment group, but with low/no service usage.

A small sample size found for certain depression trajectory groups also limited the analytic options available. A complex statistical analysis methods often require a large sample size. Unfortunately, the nature of the small sample size led me to combine *Increasing* and *Decreasing* groups and limited the possibility of analyzing these groups individually.

A larger overall sample may partially solve these issues, and extending the data collection beyond three time points would also allow a more nuanced groupings of depression trajectories as well as more options of data analyses that may further shed light on the nature of maternal depression among adolescent mothers. Specifically, additional qualitative analyses of the different depression trajectory groups may provide richer insights into who these mothers are and the nature of their lives.

Lastly, the future studies should also consider the way constructs are measured. In this study, the way depression was measured was by using a screening tool and not a diagnostic tool,

so it is difficult to determine whether the participating parents were “truly depressed.” Furthermore, this study did not examine the contributory factors in the genesis of depression. These include genetic disposition to develop depression, family history of depression, and comorbidity with other psychosocial issues (e.g., substance abuse, bipolar disorder). Thus, merely looking at the presence and symptoms of depression may not fully capture the experiences of maternal depression. Some of the other variables examined were also self-reported or comprised of only one indicator. Child maltreatment was based on the records from the Massachusetts Department of Children and Families (DCF), and was defined as the number of reports filed, regardless of substantiation. While the data from DCF are regularly collected with adherence to state standards, providing some level of common standards to the way child maltreatment is defined, many of the child maltreatment cases often never come to the attention of authorities (DePanfilis & Dubowitz, 2005; Hussey et al., 2005). Furthermore, the mere number of reports may not represent the entire nature of child maltreatment such as the severity or chronicity of the incident. The current study also were not able to differentiate the types of maltreatment in the analyses due to very small percentage of physical abuse and sexual abuse reports, and studies have suggested the importance of distinguishing types of maltreatment to further decipher the etiology of maltreatment (Bartlett et al., 2013; Chaffin et al., 1996). That said, the majority of the reports in this study comprised of neglect (97.5%), so despite the lack of differentiation in the maltreatment types, this study still contributes to the child neglect research, which is often understudied in the literature of child maltreatment, especially among very young children (Bartlett et al., 2013; DePanfilis & Dubowitz, 2005). The inclusion of both unsubstantiated and substantiated reports can also portray a fuller picture of what a child is experiencing, given that the use of substantiated reports may not often depict the full nature of

child maltreatment experienced by a child (Bartlett, 2012; Cross & Casanueva, 2009; Drake et al., 2003; Yuan et al., 2005). There is still room for improvement; to expand the nature of variables explored, future studies may include alternative measures such as self-reported accounts of child abuse and neglect, a diagnostic tool and categories of symptoms in assessing depression, and observed measures of mother-father relationship. Inclusion of such alternative measures provides more rich and precise look at the nature of variables examined.

Implications for Research, Policy and Practice

Despite the limitations above, the current investigation contributes valuable knowledge towards improving our capacity to investigate and promote child well-being and prevent child maltreatment in the presence of challenges such as maternal depression. First and foremost, the heightened risk of recidivism reinforces the importance of implementing effective prevention efforts during the early months of children's lives. While public efforts have been made in reducing child maltreatment and the overall rate of child maltreatment has decreased in recent years, infants under one year are still facing the highest risk of child maltreatment, particularly of neglect (USDHHS, 2015). Many of these children are likely to be maltreated repeatedly (Kohl et al., 2011a; Kotch et al., 1997). This troubling nature of child maltreatment further suggests the need of public and policy investment in developing and implementing new and/or refined approaches to addressing child maltreatment.

One component critical in achieving such prevention efforts is the addressing of maternal mental health in conjunction with promoting positive parenting. The experiences of maternal depression among adolescent mothers are heterogeneous, and those who are chronically and severely depressed are at greatest risk for child maltreatment if they continue to struggle with parenting during the first year. Unfortunately, programs are often inadequately equipped in

identifying and addressing maternal depression and even when they are identified, mothers struggling with depression are often difficult to engage in programs (Ammerman et al., 2010). With the current policy investment in enhancing home visitation programs, the field has begun to address maternal depression and has seen a progress with programs such as Moving Beyond Depression that works to improve maternal mental health in conjunction with parenting (Ammerman et al., 2010). This progress in the field, as well as the continuous struggle in addressing maternal mental health, further emphasizes the need of continuing with regular screening and monitoring protocols for maternal mental health. This requires strong and well-concerted collaboration with other mental health agencies, accommodating to the contexts and population served by home visitation programs, allowing each sector to address what they are trained for, and streamlining service delivery (Ammerman et al., 2013). Furthermore, not only is this collaborative effort applicable to maternal mental health, but also may be effective in supporting mothers in establishing better support networks. Such collaborative relationships will become more effective by establishing good follow-up systems, both within and across agencies, and perhaps monthly across-agency meetings that address issues and difficulties faced during service delivery.

Furthermore, the known difficulty of engaging mothers who are depressed and the great benefits these mothers may get from engaging in a program early on emphasizes the investment in outreach efforts. The quality of the relationship that home visitors and mothers develop can either keep mothers in the program or deflect them from continuing with the services (Duggan et al., 2007; Olds & Kitzman, 1993; TIER, 2014). Thus, assisting home visitors in how they engage and build relationships with their clients may promote more effective program service delivery and prevent disconnects from the mothers who may need the services. Such

relationship building comes from truly respecting family culture and may perhaps need to be the foreground in staff training.

This program engagement efforts may be particularly critical in promoting healthy functioning among young mothers who are depressed, and the current study findings highlight several other factors to be considered. First, the study found that early positive parenting was critical for reducing subsequent child maltreatment reports among adolescent mothers who were chronically and severely depressed. While this finding naturally emphasizes the importance of promoting early positive parenting, it is also important to understand the multi-pronged goals that programs aim to achieve, from reducing child maltreatment to improving life skills among parents. Each goal is equally critical in promoting healthy functioning among young mothers, but often times, achieving all these goals can be overwhelming for mothers as well as for the home visitors to address. While it is important to adhere to and achieve these goals since each one is highly correlated to the success of one another, the sequencing or prioritizing of goals may be necessary based on the unique needs of each young mother. Given the current study findings, helping mothers establish healthy bond and attachment with their infants may be considered the core basis of services that programs aim to achieve, which may be supplemented by addressing the other goals.

Promoting early positive parenting may be a priority since the primary goal of the home visitation program examined in this study is the prevention of child maltreatment. However, each family has different and unique sets of strengths and needs. From this study, mothers who are at great risk for poor parenting may require more home visits and longer duration of program enrollment. Mothers who are chronically depressed may need to focus on establishing positive early parenting. With unique sets of strengths and risks, each family shows different ways and

needs for engaging in services. Therefore, programs should consider tailoring services to the unique characteristics of the families by providing varying venues of services (e.g., different modes of communication and service delivery). In order to know the precise combination of services needed, programs need to establish strong connections with other agencies that can supplement the services provided. This way, home visitors can focus on prioritizing services that are needed rather than attempting to resolve everything by themselves.

The enhancement and tailoring of support programs may further benefit adolescent mothers by fine-tuning the ways in which programs coach mothers about childrearing. Young mothers may lack the maturity to understand their infants' mental states, and given their still-maturing cognitive ability, traditional parenting trainings (e.g., brochures, fact sheets) may not be as helpful as direct coaching and role modeling for young mothers. Thus, by reflecting with mothers on their interactions with their children and showing them specifically the signals and patterns their babies are using to express their thoughts, adolescent mothers may be able to cultivate better parenting skills and "mentalization" skills that they often lack.

Prevention of child maltreatment is certainly prioritized in promoting healthy adolescent parenting. This study's findings also adhere to this claim. However, the high rate of repeated reports experienced by young children also necessitates refocusing of services provided to families after the initial reports are filed. Especially with unsubstantiated reports, the potential risk of harm put to children is often unrecognized (Bartlett, 2012; Cross & Casanueva, 2009; Yuan et al., 2005), and children who had unsubstantiated reports are as likely as those with substantiated reports to be re-reported (Drake et al., 2003; Kohl et al., 2009). To avoid repeated abuse and neglect and to avoid loss of families through the systems' cracks, it may become

critical to refine how services are provided and how collateral relationships are maintained after the report is filed.

All of this revamping and refocusing of programs is only possible with policy development that benefits vulnerable families and children and sufficient funding that would allow such program implementation and enhancement. Recent political attention and investment in the enhancement of evidence-based home visitation programs has certainly brought some improvements in the program service delivery. Yet, every political shift brings different agendas and foci, and improvements in other service sectors (e.g., public housing, education) might resolve some of the burdens taken on by home visitors and families. Thus, it becomes critical to maintain and advocate for continuous attention and funding to support vulnerable families and children from every angle possible.

Although researchers have started to emphasize the importance of parental mental health and father involvement when examining adolescent parenthood (Ammerman et al., 2010; Beers & Hollo, 2009; NRC & IOM, 2009), there is still more to explore, and the current investigation contributes valuable insights for future researches in examining maternal depression, parenting, and child maltreatment. First, the use of different instruments, from self-report of behaviors to observations of behaviors by the researchers emphasizes multifaceted methods of analysis. Not only should studies incorporate multiple indicators of a construct, but consider examining these indicators in multiple ways (e.g., self-report, observation, categorical items, continuous scoring). The current investigation attempted to incorporate various indicators of constructs examined using multiple forms of assessment. The investigations of maternal depression, adolescent parenthood, and child maltreatment would also benefit from the use of qualitative analyses, which may add richer understanding of the experience of adolescent mothers.

In addition to methodological considerations, future studies should also consider examining several critical constructs relevant to maternal depression, adolescent parenthood, and child maltreatment. This study suggests that adolescent mothers are resilient in the presence of their depression and enhancing their parenting and support systems may protect their children from maltreatment. However, it is still evident that many adolescent mothers are at risk for chronic depression and they are still prone to abusive and neglectful behavior when opportunity arises. Thus, future studies should continue to consider other risk factors such as adolescent mothers' engagement in risky behaviors and stress factors, as well as presence of cumulative effect of demographic factors, that may increase the chance of maternal depression and child maltreatment. Although the importance of father involvement and support has become more evident, fathers are not often included in the studies that examine maternal depression and child maltreatment. Furthermore, given the fluidity of romantic relationships among adolescent mothers, the role of the current partner and the child's biological father may pose different impacts on mothers' mental health and their parenting. Therefore, future studies should also consider examining and differentiating the role of "father figures" in relation to maternal functioning. While mother-father relationship is often the primary relationship that poses impact on maternal functioning (Beers & Hollo, 2009; Bunting & McAuley, 2004), maternal grandmother is often a prominent figure in teenage mothers' lives and in their parenting. Thus it is still important to examine the role of maternal grandmother in conjunction with the mother-father relationship, and further understand the criticality of these relationships and their potential to provide support in the context of early parenting.

Many studies, including this study, are often only able to examine partner relationships through mothers' report, which may be different from the actual quality of the relationship.

While mothers' satisfaction with their relationship with their partners is often a strong predictor of maternal functioning (Fagan & Lee, 2010; Quinlivan et al., 2004), inclusion of multiple measures that examine partner relationships (e.g., fathers' perception of the relationship, observations of mother-father interaction) may enhance our understanding and fully capture the nature of partner relationship and how it affects maternal functioning. Lastly, home visitation is considered an effective method of engaging and promoting positive parenting among adolescent mothers. However, its effect is still inconclusively documented (Duggan et al., 2007; Howard & Brooks-Gunn, 2009). This study began to unravel components of programs that may be critical to promoting healthy parenting among adolescent mothers and suggested the effectiveness of program may depend on the risks and strengths of the families and how programs can address the needs during the early months of parenthood. Thus, future studies should further investigate other program indicators more relevant and unique to adolescent parenthood, and perhaps examine them concurrently in some combination rather than individually, that may decipher the effectiveness of home visitation programs in depth.

Conclusion

Adolescent motherhood is often perceived as a risk for the development of both a mother and her child. While maternal depression often poses additional risks by limiting parental competence and compromising the development of the children (Ammerman et al., 2010; Field, 2010; Field et al., 2009; Lanzi et al., 2009), many young mothers do become successful in raising their children and their children show high social functioning (Easterbrooks et al., 2010). Such variability in the developmental outcomes further highlights the claim that the bio-ecological model makes in the influences of multiple living contexts on young mothers' parenting and their children's development.

This study attempted to understand the complex link between maternal depression and child maltreatment by examining the trajectories of maternal depression over the first years of parenthood, and investigating the links between parenting, child maltreatment, and protective factors across different trajectories of maternal depression. The findings of this study confirmed the heterogenic nature of maternal depression and emphasized the importance of child maltreatment prevention efforts in the early years. This study also found further support for the assertion that the presence of resilient parenting functioning in the context of great adversity such as chronic and severe maternal depression can reduce the risk of child maltreatment. The current findings points to several opportunities for program and policy adjustments: 1) continue fostering regular screening for depression by enhancing collaboration with other mental health agencies, 2) address outreach and program engagement efforts for families struggling with depression, 3) tailor services suitable for adolescent mothers and sequence service delivery, 4) reconsidering services provided after the initial child maltreatment report is filed, and finally 5) advocate for funding and policy development that will serve vulnerable families and children, prevent child maltreatment, and promote child well-being. Although programs aiming to support adolescent mothers have varying successes in preventing unhealthy parenting and child maltreatment, the revamping of programs may improve the effectiveness of such programs and support adolescent mothers who may be facing challenges, but are capable of becoming the parents that all children need.

References

- Aber, J. L., Belsky, J., Slade, A., & Crnic, K. (1999). Stability and change in mothers' representations of their relationship with their toddlers. *Developmental Psychology, 35*, 1038-1047.
- Aber, J., Slade, A., Berger, B., Bresgi, I., & Kaplan, M. (1985). *The Parent Development Interview*. Unpublished protocol, The City University of New York.
- Afifi, T. O. (2007). Child abuse and adolescent parenting. *Journal of Aggression, Maltreatment & Trauma, 14*(3), 89-105.
- Allison, P. D. (2002). *Missing Data*. Thousand Oaks, CA: Sage.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* 4th ed., text rev.). Washington, DC: Author.
- Ammaniti, M., Tambelli, R., & Odorisio, F. (2013). Exploring maternal representations during pregnancy in normal and at-risk samples: The use of the interview of maternal representations during pregnancy. *Infant Mental Health Journal, 34*(1), 1-10.
- Ammerman, R. T., Putnam, F. W., Bosse, N. R., Teeters, A. R., & Van Ginkel, J. B. (2010). Maternal depression in home visitation: A systematic review. *Aggression & Violent Behaviors, 15*(3), 191-200.
- Ammerman, R. T., Putnam, F. W., Altaye, M., Chen, L., Holleb, L. J., Stevens, J., & Van Ginkel, J. B. (2009). Changes in depressive symptoms in first time mothers in home visitation. *Child Abuse & Neglect, 33*, 127-138.
- Ammerman, R. T., Putnam, F. W., Altaye, M., Stevens, J., Teeters, A. R., & Van Ginkel, J. B. (2013). A clinical trial of in-home CBT for depressed mothers in home visitation. *Behavioral Therapy, 44*(3), 359-372.

- Ammerman, R. T., Putnam, F. W., Stevens, J., & Holleb, L. (May, 2003) *Course of depression in first-time mothers in home visitation*. Paper presented at the Society for Prevention Research, Washington, D.C.
- Ammerman, R. T., Putnam, F. W., Stevens, J., Holleb, L. J., Novak, A. L., & Van Ginkel, J. B. (2005). In-home cognitive behavior therapy for depression: An adapted treatment for first-time mothers in home visitation. *Best Practices in Mental Health, 1*(1), 1-14.
- Ammerman, R. T., Shenk, C. E., Teeters, A. R., Noll, J. G., Putnam, F. W., & Van Ginkel, J. B. (2012). Impact of depression and childhood trauma in mothers receiving home visitation. *Journal of Child and Family Studies, 21*, 612-625.
- Applegate, J. S., & Shapiro, J. R. (2005). *Neurobiology for clinical social work: Theory and practice*. New York, NY: Norton & Company, Inc.
- Arnott, B. & Meins, E. (2008). Continuity in mind-mindedness from pregnancy to the first year of life. *Infant Behavior and Development, 31*, 647-654.
- Astuto, J., & Allen, L. (2009). Home visitation and young children: An approach worth investing in? *Society for Research in Child Development Social Policy Report, 23*, 3-21.
- Avellar, S. A., & Supplee, L. H. (2013). Effectiveness of home visiting in improving child healthy and reducing child maltreatment. *Pediatrics, 132*, S90-99.
- Aviezer, O., Sagi, A., Joels, T., & Ziv, Y. (1999). Emotional availability and attachment representations in kibbutz infants and their mothers. *Developmental Psychology, 35*, 811-821.
- Azar, S. T. (2002). Parenting and child maltreatment. In M. H. Bornstein (Ed.), *Handbook of parenting*. (pp. 361-388). Hillsdale, NJ: Lawrence Erlbaum.

- Banyard, V. L., Williams, L. M., & Siegel, J. A. (2003). The impact of complex trauma and depression on parenting: An exploration of mediating risk and protective factors. *Child Maltreatment, 8*(4), 334-349.
- Barlow, A., Mullany, B., Neault, M., Compton, S., Carter, A., Hastings, R., Walkup, J. T. (2013). Effect of a paraprofessional home-visiting intervention on American Indian teen mothers' and infants' behavioral risks: A randomized controlled trial. *American Journal of Psychiatry, 170*(1), 83-93.
- Barnet, B., Liu, J., DeVoe, M., Alperovitz-Bichell, K., & Duggan, A. K. (2007). Home visiting for adolescent mothers: Effects on parenting, maternal life course, and primary care linkage. *Annals of Family Medicine, 5*(3), 224-232.
- Barrett, A. E., & Turner, R. J. (2005). Family structure and mental health: The mediating effects of socioeconomic status, family process and social stress. *Journal of Health and Social Behavior, 46*(2), 156-169.
- Bartlett, J. D. (2012). *Young mothers, infant neglect, and discontinuities in intergenerational cycles of maltreatment* (Doctoral dissertation). Tufts University, Massachusetts.
- Bartlett, J. D., Raskin, M., Kotake, C., Nearing, K. D., & Easterbrooks, M. A. (2014). An ecological analysis of infant neglect by adolescent mothers. *Child Abuse & Neglect, 38*(4), 723-734.
- Bates, L., Luster, T., & Vandenbelt, M. (2002). Factors related to social competence in elementary school among children of adolescent mothers. *Social Development, 12*(1), 107-124.
- Beardslee, W. R. (2002). *Out of a darkened room when a parent is depressed: Protecting children and strengthening the family*. Boston, MA: Little Brown and Company.

- Beeghly, M., Weinberg, M. K., Olson, K. L., Keman, H., Riley, J. & Tronick, E. Z. (2002). Stability and change in level of maternal depressive symptomatology during the first postpartum year. *Journal of Affective Disorders, 71*(3), 169-180.
- Beers, L. A. S., & Hollo, R. E. (2009). Approaching the adolescent-headed family: A Review of teen parenting. *Current Problem in Pediatric Adolescent Health Care, 39*, 216-233.
- Begle, A. M., Dumas, J. E., & Hanson, R. F. (2010). Predicting child abuse potential: An empirical investigation of two theoretical frameworks. *Journal of Clinical Child and Adolescent Psychology, 39*(2), 208-219.
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*(1), 83-96.
- Belsky, J. (1993). Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin, 114*(3), 413-434.
- Berger, L. M., Paxson, C., & Waldfogel, J. (2009). Mothers, men, and child protective services involvement. *Child Maltreatment, 14*(3), 263-276.
- Biringen, Z., Robinson, J. L., & Emde, R. N. (1998). *Emotional Availability Scales* (3rd ed.). Colorado State University, Department on Human Development and Family Studies, Fort Collins, CO.
- Black, M. M., Papas, M. A., Hussey, J. M., Dubowitz, H., Kotch, J. B., & Starr, R. H. (2002). Behavior problems among preschool children born to adolescent mothers: Effects of maternal depression and perceptions of partner relationships. *Journal of Clinical Child and Adolescent Psychology, 31*(1), 16-26.

- Boris, N. W., Larrieu, J. A., Zeanah, P. D., Nagle, G. A., Steier, A., & McNeill, P. (2006). The process and promise of mental health augmentation of nurse home-visiting program: Data from the Louisiana nurse-family partnership. *Infant Mental Health Journal, 27*(1), 26-40.
- Borkowski, J. G., Whitman, T. L., & Farris, J. R. (2007). Adolescent mothers and their children: Risks, resilience, and development. In J. G. Borkowski, J. R. Farris, T. L. Whitman, S. S. Carothers, K. Weed, & D. A. Keogh (Eds.), *Risk and resilience: Adolescent mothers and their children grow up*, (pp. 1-34). Mahwah, NJ: Erlbaum.
- Bornstein, M. H., Gini, M., Suwalsky, J. T. D., & Leach, D. B. (2006). Emotional Availability in mother-child dyads: Short-term stability and continuity from variable-centered and person-centered perspectives. *Merrill-Palmer Quarterly, 52*(3), 547-571.
- Bornstein, M. H., Putnick, D. L., Heslington, M., Gini, M., Suwalsky, J. T. D., Venuti, P.,... de Galperin, C. Z. (2008). Mother-child emotional availability in ecological perspective: Three countries, two regions, two genders. *Developmental Psychology, 44*(3), 666-680.
- Bornstein, M., H., Gini, M., Putnick, D., Haynes, O.M., Painter, K., & Suwalsky, J.T.D. (2006). Short-term reliability and continuity of emotional availability in mother-child dyads across contexts of observation. *Infancy, 10*(1), 1-16.
- Bowlby, J. (1969). *Attachment and loss: Volume 1. Attachment*. New York: Basic Books.
- Breheny, M., & Stephens, C. (2010). Youth or disadvantage? The construction of teen mothers in medical journals. *Culture, Health & Sexuality, 12*(4), 307-322.
- Brodowski, M. L. (2012). *Factors associations with changes in parental depressive symptoms: A longitudinal multilevel analysis of parents at high risk for child maltreatment* (Doctoral dissertation). University of Maryland Baltimore, Maryland.

- Brodowski, M. L., Nolan, C. M. Gaudiosi, J. A., Yuan, Y. Y., Zikratova, L. A., Oritz, M. J., Aveni, M. M., ...Hammond, W.R. (2008). Non-fatal maltreatment in infants: United States, October 2005 – September 2006. *Morbidity Mortality Weekly Report*, 57(13), 336-339.
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology, Vol. 1: Theoretical models of human development*, (6th ed., pp. 793-828). New York: John Wiley.
- Broth, M. R., Goodman, S. H., Hall, C., & Raynor, L. C. (2004). Depressed and well mothers' emotion interpretation accuracy and the quality of mother-infant interaction. *Infancy*, 6(1), 37-55.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: The Guildford Press.
- Brunelli, S. A., Wasserman, G. A., Rauh, V. A., Alvarado, L. E., & Caraballo, L. R. (1995). Mothers reports of paternal support: Associations with maternal child-rearing attitudes. *Merrill-Palmer Quarterly: Journal of Developmental Psychology*, 41(2), 152-171.
- Budd, K. S., Heilman, N. E., & Kane, D. (2000). Psychosocial correlates of child abuse potential in multiply disadvantaged adolescent mothers. *Child Abuse & Neglect*, 24(5), 611-625.
- Bunting, L., & McAuley, C. (2004). Research review: Teenage pregnancy and motherhood: The contribution of support. *Child and Family Social Work*, 9, 207-215.
- Burcusa, S. L., & Iacono, W. G. (2007). Risk for recurrence in depression. *Clinical Psychological Review*, 27(8), 959-985.

- Bureau, J., Easterbrooks, M. A., & Lyons-Ruth, K. (2009). Maternal depressive symptoms in infancy: Unique contribution to children's depressive symptoms in childhood and adolescence? *Development and Psychopathology, 21*, 519-537.
- Burns, B. J., Mustillo, S. A., Farmer, E. M., Kolko, D. J., McCrae, J., Libby, A. M., & Webb, M. B. (2010). Caregiver depression, mental health service use and child outcomes. In M. B. Webb, K. Dowb, B. Jones-Harden, J. Landsverk, & M. Testa (Eds.), *Child welfare and child well-being: New perspectives from the national survey of child and adolescent well-being* (pp. 351-379). New York: Oxford University Press.
- Caldera, D., Burrell, L., Rodriguez, K., Crowne, S. S., Rohde, C., & Duggan, A. (2007). Impact of a statewide home visiting program on parenting and on child health development. *Child Abuse & Neglect, 31*, 829-852.
- Cameron, C. A., & Trivedi, P. K. (2013). *Regression analysis of count data* (2nd ed.). New York, NY: Cambridge University Press.
- Campbell, S. B., Cohn, J. E., & Meyers, T (1995). Depression in first time mothers: Mother-infant interaction and depression chronicity. *Developmental Psychology, 60*, 349-357.
- Campbell, S. B., Matestic, P., Von Stauffenberg, C., Mohan, R., & Kirchner, T. (2007). Trajectories of maternal depressive symptoms, maternal sensitivity, and children's functioning at school entry. *Developmental Psychology, 43*(5), 1202-1215.
- Casady, M.A., & Lee, R.E. (2002). Environments of physically neglected children. *Psychological Reports, 91*, 711-721.
- Casanueva, C., Cross, T. P., Ringeisen, H., & Christ, S. L. (2011). Prevalence, trajectories, and risk factors for depression among caregivers of young children involved in child

- maltreatment investigations. *Journal of Emotional and Behavioral Disorders*, 19(2), 98-116.
- Casey, B. J., Jones, R. M., & Hare, T. A. (2008). The adolescent brain. *Annals of the New York Academy of Science*, 1124, 111-126.
- Cassidy, B., Zoccolillo, M., & Hughes, S. (1996). Psychopathology in adolescent mothers and its effects on mother-infant interactions: A pilot study. *Canadian Journal of Psychiatry*, 41, 379-384.
- Caughy, M. O., Huang, KY, & Lima, J. (2009). Patterns of conflict interaction in mother-toddler dyads: Differences between depressed and non-depressed mothers. *Journal of Child and Family Studies*, 18, 10-20.
- Ceballo, R., & McLoyd, V. C. (2002). Social support and parenting in poor, dangerous neighborhoods. *Child Development*, 73(4), 1310-1321.
- Center on the Developing Child at Harvard University (2009). *Maternal depression can undermine the development of young children: Working paper No. 8*. Retrieved from <http://www.developingchild.harvard.edu>.
- Cerniglia, L., & Cimino, S., & Ballarotto, G. (2014). Mother-child and father-child interaction with their 24-month-old children during feeding, considering paternal involvement and the child's temperament in a community sample. *Infant Mental Health Journal*, 35(5), 473-481.
- Chaffin, M. & Friedrich, B. (2004). Evidence-based treatments in child abuse and neglect. *Children and Youth Services Review*, 26, 1097-1113.
- Chaffin, M., Funderburk, B., Bard, D., Valle, L. A., & Gurwitch, R. (2011). A combined motivation and parent-child interaction therapy package reduces child welfare recidivism

- in a randomized dismantling field trial. *Journal of Consulting and Clinical Psychology*, 79, 84-95.
- Chaffin, M., Kelleher, K., & Hollenberg, J. (1996). Onset of physical abuse and neglect: Psychiatric, substance abuse, and social risk factors from prospective community data. *Child Abuse & Neglect*, 20(3), 191-203.
- Chaudhuri, J. H., Easterbrooks, M. A., & Davis, C. R. (2009). The relation between emotional availability and parenting style: Cultural and economic factors in a diverse sample of young mothers. *Parenting*, 9(3), 277-299.
- Chazan-Cohen, R., Ayoub, C., Pan, B. A., Roggman, L., Raikes, H., McKelvey, L...Hart, A. (2007). It takes time: Impacts of Early Head Start that lead to reductions in maternal depression two years later. *Infant Mental Health Journal*, 28(2), 151-170.
- Cherniss, C., & Herzog, E. (1996). Impact of home-based family therapy on maternal and child outcomes in disadvantaged adolescent mothers. *Family Relations*, 45(1), 72-79.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233-255.
- Choi, H., Yamashita, T., Wada, Y., Narumoto, J., Nanri, H., Fujimori, A...& Fukui, J. (2010). Factors associated with postpartum depression and abusive behaviors in mothers with infants. *Psychiatry and Clinical Neurosciences*, 64, 120-127.
- Chung, E. K., McCollum, K. F., Elo, I. T., Lee, H. J., & Culhane, J. F. (2004). Maternal depressive symptoms and infant health practices among low-income women. *Pediatrics*, 113(6), 523-529.
- Cicchetti, D. (2004). An odyssey of discovery: Lessons learned through three decades of research on child maltreatment. *American Psychologist*, 59(8), 4-14.

- Cicchetti, D., & Toth, S. L. (1995). A developmental psychopathology perspective on child abuse and neglect. *Journal of the American Academy of Child and Adolescent Psychiatry*, *34*, 541-565.
- Cohen, L. R., Hien, D. A., & Batchelder, S. (2008). The impact of cumulative maternal trauma and diagnosis on parenting behavior. *Child Maltreatment*, *13*(1), 27-38.
- Colletta, N. D. (1983). At risk for depression: A study of young mothers. *The Journal of Genetic Psychology*, *142*, 301-310.
- Collins, W. A. (2003). More than myth: The developmental significance of romantic relationships during adolescence. *Journal of Research on Adolescence*, *13*, 1-24.
- Collins, W. A., Welsh, D. P., & Furman, W. (2009). Adolescent romantic relationships. *Annual Review of Psychology*, *60*(25), 1-22.
- Colonesi, C., Wissink, I., Noom, M. J., Asscher, J. J., Hovee, M., Stams, G. J. J. M., Kellaert-Knol, M. G. (2012). Basic trust: An attachment-oriented intervention based on mind-mindedness in adoptive families. *Research on Social Work Practice*, *23*(2), 179-188.
- Combs-Orme, T. & Cain, D.S. (2008). Predictors of mothers' use of spanking with their infants. *Child Abuse & Neglect*, *32*, 649-657.
- Connelly, C. D., & Straus, M. A. (1992). Mother's age and risk for physical abuse. *Child Abuse & Neglect*, *16*, 709-718.
- Conron, K. J., Beardslee, W. R., Koenen, K. C., Buka, S. L., & Gortmaker, S. L. (2009). A longitudinal study of maternal depression and child maltreatment in a national sample of families investigated by child protective services. *Archives of Pediatrics and Adolescent Medicine*, *163*(10), 922-930.

- Conroy, S., Marks, M. N., Schacht, R., Davies, H. A., & Moran, P. (2010). The impact of maternal depression and personality disorder on early infant care. *Social Psychiatry Epidemiology, 45*, 285-292.
- Contreras, J. M. (2004). Parenting behaviors among mainland Puerto Rican adolescent mothers: The role of grandmother and partner involvement. *Journal of Research on Adolescence, 14*(3), 341-368.
- Contreras, J. M., Lopez, I. R., Rivera-Mosquera, E. T., Raymond-Smith, L., & Rothstein, K. (1999). Social support and adjustment among Puerto Rican adolescent mothers: The moderating effect of acculturation. *Journal of Family Psychology, 13*(2), 228-243.
- Copeland, D. B., & Harbaugh, B. L. (2010). Psychosocial differences related to parenting infants among single and married mothers. *Issues in Comprehensive Pediatric Nursing, 33*(3), 129-148.
- Cornish, A. M., McMahan, C. A., Ungerer, J. A., Barnett, B., Kowalenko, N., & Tennant, C. (2006). Maternal depression and the experience of parenting in the second postnatal year. *Journal of Reproductive and Infant Psychology, 24*(2), 121-132.
- Cox, J. L., Murray, D., & Chapman, G. (1993). A controlled study of the onset, duration and prevalence of postnatal depression. *British Journal of Psychiatry, 163*, 27-31.
- Cross, T. P., & Casanueva, C. (2009). Caseworkers judgments and substantiation. *Child Maltreatment, 14*(1), 38-52.
- Culp, A. M., Culp, R. E., Blankmeyer, M., & Passmark, L. (1998). Parent education home visitation program: Adolescent and nonadolescent mother comparison after six months of intervention. *Infant Mental Health Journal, 19*(2), 111-123.

- Curtona, C. E., Hessling, R. M., Bacon, P. L., & Russell, D. W. (1998). Predictors and correlates of continuing involvement with the baby's father among adolescent mothers. *Journal of Family Psychology, 12*(3), 369-387.
- Daro, D. & Dodge, K. A. (2010). Strengthening home-visiting intervention policy: Expanding reach, building knowledge. In R. Haskins & W. S. Barnett (Eds.), *Investing in Young Children: New Directions in Federal Preschool and Early Childhood Policy*, (pp. 79-88). Washington, DC: Brookings and NIEER.
- Davis, A. A. (2002). Younger and older African American adolescent mothers' relationships with their mothers and female peers. *Journal of Adolescent Research, 17*(5), 491-508.
- Davis, E. P., Glynn, L. M., Schetter, C. D., Hobel, C., Chcz-Demet, A., & Sandman, C. A. (2007). Prenatal exposure to maternal depression and cortisol influences infant temperament. *American Academy of Child and Adolescent Psychiatry, 46*(6), 737-746.
- Dawson, G., Ashman, S. B., Hessel, D., Spieker, S., Frey, K., Panagiotides, H., & Embry, L. (2001). Autonomic and brain electrical activity in securely and insecurely attachment infants of depressed mothers. *Infant Behavior & Development, 24*, 135-149.
- Dawson, G., Ashman, S. B., Panagiotides, H., Hessel, D., Self, J., Yamada, E., & Embry, L. (2003). Preschool outcomes of children of depressed mothers: Role of maternal behavior, contextual risk, and children's brain activity. *Child Development, 74*(4), 1158-1175.
- Dayan, J., Creveuil, C., Marks, M. N., Conroy, S., Herlicoviez, M., Dreyfus, M., & Tordjman, S. (2006). Prenatal depression, prenatal anxiety, and spontaneous preterm birth: a prospective cohort study among women with early and regular care. *Psychosomatic Medicine, 68*, 938-946.

- De Wolff, M. S., & Van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development, 68*(4), 571-591.
- Deal, L. W., & Holt, V. L. (1998). Young maternal age and depressive symptoms: Results from the 1988 National maternal and infant health survey. *American Journal of Public Health, 88*(2), 266-270.
- Deave, T., Heron, J., Evans, J., Emond, A. (2008). The impact of maternal depression in pregnancy on early child development. *An International Journal of Obstetric & Gynecology, 115*(8), 1043-1051.
- Demers, I., Bernier, A., Tarabulsy, G. M., & Provost, M. A. (2010). Maternal and child characteristics as antecedents of maternal mind-mindedness. *Infant Mental Health Journal, 31*(1), 94-112.
- DePanfilis, D. (2006). *Child neglect: A guide for prevention, assessment, and intervention*. Washington, DC: U.S. Department of Health and Human Services Administration of Children and Families.
- DePanfilis, D., & Dubowitz, H. (2005). Family Connections: A program for preventing child neglect. *Child Maltreatment, 10*, 108-123.
- DeVito, J. (2010). How adolescent mothers feel about becoming a parent. *The Journal of Perinatal Education, 19*(2), 25-34.
- Diego, M. A., Field, T., Hernandez-Reif, M., Schanberg, S., Khun, C., & Gonzalez-Quintero, V. H. (2009). Prenatal depression restricts fetal growth. *Early Human Development, 85*, 65-70.
- Dix, T., & Meunier, L. N. (2009). Depressive symptoms and parenting competence: An analysis of thirteen regulatory processes. *Developmental Review, 29*, 45-68.

- Dix, T., Cheng, N., & Day, W. H. (2008). Connecting with parents: Mothers' depressive symptoms and responsive behaviors in the regulation of social contact by one and young two year olds. *Social Development, 18*(1), 24-50.
- Dollberg, D., Feldman, R., & Keren, M. (2010). Maternal representations, infant psychiatric status, and mother-child relationship in clinic-referred and non-referred infants. *European Child and Adolescent Psychiatry, 19*, 25-36.
- Downey, G., & Coyne, J. C. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin, 108*(1), 50-76.
- Drake, B., Jonson-Reid, M., Way, I., & Chung, S. (2003). Substantiation and recidivism. *Child Maltreatment, 8*(4), 248-260.
- Dubowitz, H. (2007). Understanding and addressing the "neglect of neglect:" Digging into the molehill. *Child Abuse & Neglect, 31*(6), 603-606.
- Duggan, A. J., Fuddy, L., Burrell, L., Higman, S. M., McFarlane, E., Windham, A., & Sia, C. (2004). Randomized trial of a statewide home visiting program to prevent child abuse: Impact in reducing parental risk factors. *Child Abuse & Neglect, 28*, 623-643.
- Duggan, A., Berlin, L. J., Cassidy, J., Burrell, L. & Tandon, S. D. (2009). Examining maternal depression and attachment insecurity as moderators of the impacts of home visiting for at-risk mothers and infants. *Journal of Consulting and Clinical Psychology, 77*(4), 788-799.
- Duggan, A., Caldera, D., Rodriguez, K., Burrell, L., Rohde, C., & Crowne, S. S. (2007). Impact of a statewide home visiting program to prevent child abuse. *Child Abuse & Neglect, 31*, 801-827.

- Dukewich, T. L., Borkowski, J. B., & Whitman, T. L. (1996). Adolescent mothers and child abuse potential: An evaluation of risk factors. *Child Abuse & Neglect, 20*(11), 1031-1047.
- DuMont, K., Kirkland, K., Mitchell-Herzfeld, S., Ehrard-Dietzel, S., Rodriguez, M., Lee, E., & Layne, C. (2010). *A randomized trial of Health Families New York (HFNY): Does home visiting prevent child maltreatment?* U.S. Department of Justice.
- Dunn, M. G., Tarter, R. E., Mezzich, A. D., Vanyukov, M., Kirisci, L., & Kirillova, G. (2002). Origins and consequences of child neglect in substance abuse families. *Clinical Psychology Review, 22*(7), 1063-1090.
- Eamon, M. K., & Zuehl, R. M. (2001). Maternal depression and physical punishment as mediators of the effect of poverty on socioemotional problems of children in single-mother families. *American Journal of Orthopsychiatry, 71*, 218-226.
- Easterbrooks, M. A., Bartlett, J. D., Goldberg, J., Contreras, M. M., Kotake, C., Chaudhuri, J. H., & Jacobs, F. H. (2013). Limiting home visiting effects: Maternal depression as a moderator of child maltreatment. *Pediatrics, S126-133*.
- Easterbrooks, M. A., Biesecker, G., & Lyons-Ruth, K. (2000). Infancy predictors of emotional availability in middle childhood: The roles of attachment security and maternal depressive symptomatology, *Attachment & Human Development, 2*(2), 170-187.
- Easterbrooks, M. A., Chaudhuri, J. H., & Gestsdottir, S. (2005). Patterns of emotional availability among young mothers and their infants: A dyadic, contextual analysis. *Infant Mental Health Journal, 26*(4), 309-326.
- Easterbrooks, M. A., Chaudhuri, J. H., Bartlett, J. D., & Copeman, A. (2010). Resilience in parenting among young mothers: Family and ecological risks and opportunities, *Children and Youth Services Review, 1-9*.

- Eaton, N. R., Keyes, J. M., Krueger, R. F., Balsis, S., Skodol, A. E., Markon, K. E., ...Hasin, D. S. (2012). An invariant dimensional liability model of gender differences in mental disorder prevalence: Evidence from a national sample. *Journal of Abnormal Psychology, 121*(1), 282-288.
- Eckenrode, J., Ganzel, B., Henderson, C. R., Smith, E., Olds, D. L., Powers, J., ...Sidora, K. (2000). Preventing child abuse and neglect with a program of nurse home visitation. *Journal of American Medical Association, 284*(11), 1385-1391.
- Edwards, R. C., Thullen, M. J., Isarowong, N., Shiu, C, Henson, L., & Hans, S. L. (2012). Supportive relationships and the trajectory of depressive symptoms among young, African American mothers. *Journal of Family Psychology, 26*(4), 585-594.
- Enders, C. K. (2010). *Applied Missing Data Analysis*. New York, NY: The Guilford Press.
- English, D. J., Marshall, D. B., & Orme, M. Characteristics of repeated referrals to child protective services in Washington State. *Child Maltreatment, 4*, 290-307.
- Erikson, E.H. (1963). *Childhood and society*. (2nd ed.). New York: Norton.
- Erickson, M. F., & Egeland, B. (2002). Child neglect. In J. Briere, L. Berliner, C. T. Hendrix, C. Jenny, & T. Reid (Eds.), *The APSAC handbook on child maltreatment*, (2nd ed., pp. 3-20). Thousand Oaks, CA: Sage.
- Fagan, J., & Lee, Y. (2010). Perceptions and satisfaction with father involvement and adolescent mothers' postpartum depressive symptoms. *Journal of Youth and Adolescence, 39*, 1109-1121.
- Fallon, B., Ma, J., Black, T., & Wekerle, C. (2011). Characteristics of young parents investigated and opened for ongoing services in child welfare. *International Journal of Mental Health and Addiction, 9*, 365-381.

- Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect, 36*, 156-165.
- Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behavior & Development, 33*, 1-6.
- Field, T., Diego, M., & Hernandez-Reif, M. (2006). Prenatal depression effects on the fetus and newborn: A review. *Infant Behavior & Development, 29*, 445-455.
- Field, T., Diego, M., & Hernandez-Reif, M. (2009). Depressed mothers' infants are less responsive to faces and voices. *Infant Behavior & Development, 32*, 239-244.
- Field, T., Pickens, J., Prodromidis, M., Malpheurs, J., Fox, N., Bendell, D... & Kuhn, D. (2000). Targeting adolescent mothers with depressive symptoms for early intervention. *Adolescence, 35*, 381-414.
- Figueiredo, B. & Conde, A. (2011). Anxiety and depression symptoms in women and men from early pregnancy to 3-months postpartum: Parity differences and effects. *Journal of Affective Disorders, 132*(1-2), 146-157.
- Fuhrer, I., McMahon, C. A., & Taylor, A. J. (2009). The impact of postnatal and concurrent maternal depression on child behavior during the early school years. *Journal of Affective Disorders, 119*, 116-123.
- Fluke, J. D., Yuan, Y. Y. T., & Edwards, M. (1999). Recurrence of maltreatment: An application of the National Child Abuse and Neglect Data System (NCANDS). *Child Abuse & Neglect, 23*, 633-650.
- Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology, 9*, 679-700.

- Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal*, *12*(3), 201-218.
- Font, S. A., & Berger, L. M. (2014). Child maltreatment and children's developmental trajectories in early to middle childhood. *Child Development*. Retrieved from <http://onlinelibrary.wiley.com.ezproxy.library.tufts.edu/store/10.1111/cdev.12322/asset/cdev12322.pdf?v=1&t=i61lrp9h&s=b09713233a01abc92e6aa96406ab9406a95059bf>.
- Foster, C. J., Garber, J., & Durlak, J. A. (2008). Current and past maternal depression, maternal interaction behaviors, and children's externalizing and internalizing symptoms. *Journal of Abnormal Child Psychology*, *26*, 527-537.
- Fraser, J. A., Armstrong, K. L., Morris, J. P., & Dadds, M. R. (2000). Home visiting intervention for vulnerable families with newborns: Follow-up results of a randomized controlled trial. *Child Abuse & Neglect*, *24*(11), 1399-1429.
- Gavin, A. R., Lindhorst, T., & Lohr, M. J. (2011). The prevalence and correlates of depressive symptoms among adolescent mothers: Results from a 17-year longitudinal study. *Women & Health*, *51*(6), 525-545.
- Gee, C. B. & Rhodes, J. E. (1999) Postpartum transitions in adolescent mothers' romantic and maternal relationships. *Merrill Palmer Quarterly*, *45*, 512-532.
- Gee, C. B., & Rhodes, J. E. (2008). A social support and social strain measure for minority adolescent mothers: A confirmatory factor analysis study. *Child: Care, Health and Development*, *34*(1), 87-97.
- Geiser, C. (2013). *Data analysis with MPlus*. New York, NY: Guilford Publications, Inc.

- Gershater-Molko, R. M., Lutzker, J. R., & Wesch, D. (2002). Using recidivism data to evaluate project SafeCare: Teaching bonding, safety, and health care skills to parents. *Child Maltreatment, 7*(3), 277-285.
- Gershoff, E. T. (2002). Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychological Bulletin, 128*, 539-579.
- Gilbert, R., Spatz-Widom, C., Browne, K., Fergusson, D., Webb, E., & Janson, J. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet, 373*, 68-81.
- Goldstein, L. H., Diener, M. L., & Mangelsdorf, S. C. (1996). Maternal characteristics and social support across the transition to motherhood: Associations with maternal behavior. *Journal of Family Psychology, 10*, 60-71.
- Gomby, D. (2005). *Home visitation in 2005: Outcomes for children and parents*. Sunnyvale, CA: Committee for Economic Development, Invest in Kids Working Group. Retrieved from <http://legis.wisconsin.gov/lc/committees/study/2008/SFAM08/files/GombyHVoutcomes2005.pdf>.
- Goodman, G., & Aber, J. L. (2010). Predictors of representational aggression in preschool children of low-income urban African American adolescent mothers. *Infant Mental Health Journal, 31*(1), 33-57.
- Goodman, J. H. (2004). Postpartum depression beyond the early postpartum period. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 33*(4), 410-420.

- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review, 106*(3), 458-490.
- Gray, J. A. M. (2001). The origin of evidence-based practice. In A. Edwards & G. Elwyn (Eds.), *Evidence-informed client choice*, (pp. 19-33). New York: Oxford.
- Grienenberger, J., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother-infant affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment & Human Development, 7*(3), 299-311.
- Gustafsson, H. C., & Cox, M. J. (2012). Relations among intimate partner violence, maternal depressive symptoms, and maternal parenting behaviors. *Journal of Marriage and Family, 74*, 1005-1020.
- Guterman, N. B. (2001). *Stopping child maltreatment before it starts: Emerging horizons in early home visitation services*. Thousand Oaks, CA: Sage.
- Haglund, M. E. M., Nestadt, P. S., Cooper, N. S., Southwick, S. M., & Charney, D. S. (2007). Psychobiological mechanisms of resilience: Relevance to prevention and treatment of stress-related psychopathology. *Development and Psychopathology, 19*, 889-920.
- Hammond-Ratzlaff, A., & Fulton, A. (2001). Knowledge gained by mothers enrolled in a home visitation program. *Adolescence, 36*(143), 435-442.
- Harder, J. (2005). Prevention of child abuse and neglect: An evaluation of a home visitation parent aide program using recidivism data. *Research on Social Work Practice, 15*, 246-256.

- Hecht, D. B., & Hansen, D. J. (2001). The environment of child maltreatment: Contextual factors and the development of psychopathology. *Aggression and Violent Behavior, 6*, 433-457.
- Hien, D., Cohen, L. R., Caldeira, N. A., Flom, P. & Wasserman, G. (2010). Depression and anger as risk factors underlying the relationship between maternal substance involvement and child abuse potential. *Child Abuse & Neglect, 34*(2), 105-113.
- Hillis, S. D., Anda, R. F., Dube, S. R., Felitti, V. J., Marchbanks, P. A., Macaluso, M., & Marks, J. S. (2010). The protective effect of family strengths in childhood against adolescent pregnancy and its long-term psychosocial consequences. *Permanente Journal, 14*(3), 18-27.
- Hindley, N., Ramchandani, P. G., & Jones, D. P. H. (2006). Risk factors for recurrence of maltreatment: A systemic review. *Archives of Disease in Childhood, 91*, 744-752.
- Hoffman, C., Crnic, K., & Baker, J. (2006). Maternal depression and parenting: Implications for children's emergent emotion regulation and behavioral functioning. *Science and Practice, 6*, 271-295.
- Honig, A. S., & Morin, C. (2001). When should programs for teen parents and babies begin? Longitudinal evaluation of a teen parents and babies program. *Journal of Primary Prevention, 21*(4), 447-454.
- Horwitz, S. M., Briggs-Gowan, M. J., Storfer-Isser, A., & Carter, A. S. (2007). Prevalence, correlates, and persistence of maternal depression. *Journal of Womens Health, 16*(5), 678-691.
- Horwitz, S. M., Briggs-Gowan, M. J., Storfer-Isser, A., & Carter, A. S. (2009). Persistence of maternal depressive symptom throughout the early years of childhood. *Journal of Womens Health, 18*(5), 637-645.

- Howard, K. S., & Brooks-Gunn, J. (2009). The role of home visiting programs in preventing child abuse and neglect. *The Future of Children, 19*(2), 119-126.
- Howe, D., Dooley, T., & Hinings, D. (2000). Assessment and decision-making in a case of child neglect and abuse using an attachment perspective. *Child & Family Social Work, 5*(2), 143-155.
- Huang, C., & Lee, I. (2008). The first three years of parenting: Evidence from the Fragile Families and Child Well-Being Study. *Children and Youth Services Review, 30*, 1447-1457.
- Hubbs-Tait, L., Hughes, K. P., Culp, A. M., Osofsky, J. D., Hann, D.M., Eberhart-Wright, A., & Ware, L. M. (1996). Children of adolescent mothers: Attachment representation, maternal depression, and later behavior problems. *American Journal of Orthopsychiatry, 66*(3), 416-426.
- Hussey, J. M., Marshall, J. M., English, D. J., Knight, E. D., Lau, A. S., Dubowitz, H., & Kotch, J. B. (2005). Defining maltreatment according to substantiation: A distinction without a difference. *Child Abuse & Neglect, 29*, 479-492.
- Institute of Medicine (IOM) and National Research Council (NRC). (2013). *New directions in child abuse and neglect research*. Washington, DC: The National Academies Press.
- Jacobs, F., Easterbrooks, M.A., Brady, A.E., & Mistry, J. (2005). *Healthy Families Massachusetts Final Evaluation Report*. Medford, MA: Tufts University.
- Jennings, K. D., Ross, S., Popper, S., & Elmore, M. (1999). Thoughts of harming infants in depressed and nondepressed mothers. *Journal of Affective Disorder, 54*, 21-28.

- Jewell, N. P., & Hubbard, A. (2006). Modeling Counts: The Poisson and Negative Binomial Regression. *Analysis of Longitudinal Studies in Epidemiology*, (pp. 7-20). Boca Raton, FL: CRC Press.
- Johnson, S. B., Blum, R. W., & Giedd, J. N. (2009). Adolescent maturity and the brain: The promise and pitfalls of neuroscience research in adolescent health policy. *Journal of Adolescent Health*, 45(3), 216-221.
- Jones, N. A., Field, T., & Davalos, M. (2000). Right frontal EEG asymmetry and lack of empathy in preschool children of depressed mothers. *Child Psychiatry and Human Development*, 30(3), 189-204.
- Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass*, 2(1), 302-317.
- Kalil, A., & Kunz, J. (2002). Teenage childbearing, marital status, and depressive symptoms in later life. *Child Development*, 73(6), 1748-60.
- Kalil, A., Ziol-Guest, K. M., & Coley, R. L. (2005). Perceptions of father involvement patterns in teenage-mother families: Predictors and links to mothers' psychological adjustment. *Family Relations*, 54(2), 197-211.
- Kang, M.J. (2005). *Quality of mother-child interaction assessed by the Emotional Availability Scale: Associations with maternal psychological well-being, child behavior problems, and child cognitive functioning*. (Doctoral dissertation). Ohio State University, Ohio. Retrieved from <http://etd.ohiolink.edu/send-pdf.cgi/Kang%20Min%20Ju.pdf?osu1124158815>.

- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R... Wang, P. (2003). The epidemiology of major depressive disorder. *Journal of the American Medical Association*, 289, 3095-3105.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 593-602.
- Kessler, R. C., Heeringa, S., Lakoma, M. D., Petukhova, M., Rupp, A. E., Schoenbaum, M...Zaslavsky, A. M. (2008). Individual and societal effects of mental disorders on earnings in the United States: Results from the National Comorbidity Survey Replication. *American Journal of Psychiatry*, 165, 703-711.
- Kid Count. (2012). Children ages birth to 3 whose parents did not receive a new parent home visit. Retrieved from <http://datacenter.kidscount.org/data/tables/7875-children-ages-birth-to-3-whose-parent-did-not-receive-a-new-parent-home-visit?loc=1&loct=2#detailed/1/any/false/1021/any/15188,15187>.
- Kim, D. R., Sockol, L. E., Sammel, M. D., Kelly, C., Moseley, M., & Epperson, C. N. (2013). Elevated risk of adverse obstetric outcomes in pregnant women with depression. *Archives of Womens Mental Health*, 6(6), 475-482.
- Kinard, E. M. (2003). Adolescent childbearers in later life: Maltreatment of their school-age children. *Journal of Family Issues*, 24(5), 687-710.
- Knitzer, J., Theberge, S., & Johnson, K. (2008). *Reducing maternal depression and its impact on young children: Toward a responsive early childhood policy framework* (Project Thrive Issue Brief No.2). Retrieved from http://www.nccp.org/publications/pdf/text_791.pdf.

- Koblinsky, S. A., Kuvalanka, K., & Randolph, S. M. (2006). Social skills and behavior problems of urban, African American preschoolers: Role of parenting practices, family conflict, and maternal depression. *American Journal of Orthopsychiatry*, 76(4), 554-563.
- Kohl, P. L., Jonson-Reid, M., & Drake, B. (2009). Time to leave substantiation behind: Findings from a national probability study. *Child Maltreatment*, 14(1), 17-26.
- Kohl, P. L., Jonson-Reid, M., & Drake, B. (2011a). Maternal mental illness and the safety and stability of maltreated children. *Child Abuse & Neglect*, 35, 309-318.
- Kohl, P. L., Kagotho, J. N., & Dixon, D. (2011). Parenting practices among depressed mothers in the child welfare system. *Social Work Research*, 35(4), 215-225.
- Koniak-Griffin, D., Verzemnieks, I. L., Anderson, N. L. R., Brecht, M., Lesser, J., Kim, S. & Turner-Pluta, C. (2003). Nurse visitation for adolescent mothers: Two-year infant health and maternal outcomes. *Nursing Research*, 52(2), 127-136.
- Korosi, A., & Baram, T. Z. (2009). The pathways from mother's love to baby's future. *Frontiers in Behavioral Neuroscience*, 3, 1-8.
- Kotch, J. B., Browne, D. C., Ringwalt, C. L., Dufort, V., Ruina, E., Stewart, P. W., & Jung, J. (1997). Stress, social support, and substantiated maltreatment in the second and third years of life. *Child Abuse & Neglect*, 21(11), 1025-1037.
- Kotch, J. B., Browne, D. C., Ringwalt, C. L., Stewart, P. W., Ruina, E., Holt, K., & Jung, J. (1995). Risk of child abuse or neglect in a cohort of low-income children. *Child Abuse & Neglect*, 19(9), 1115-1130.
- Lanzi, R. G., Bert, S. C., Jacobs, B. K., & The Centers for the Prevention of Child Neglect. (2009). Depression among a sample of first-time adolescent and adult mothers. *Journal of Child and Adolescent Psychiatric Nursing*, 22(4), 194-202.

- Laranjo, J., Bernier, A., & Meins, E. (2008). Associations between maternal mind-mindedness and infant attachment security: Investigating the mediating role of maternal sensitivity. *Infant Behavior & Development, 31*, 688-695.
- Leadbeater, B. J., & Linares, O. (1992). Depressive symptoms in black and Puerto Rican adolescent mothers in the first 3 years postpartum. *Development and Psychopathology, 4*, 451-468.
- Leadbeater, B. J., & Way, N. (2001). *Growing up fast: Transitions to early adulthood of inner-city adolescent mothers*. Mahwah, NJ: Erlbaum.
- Leadbeater, B. J., Bishop, S. J., & Raver, C. C. (1996). Quality of mother-toddler interactions, maternal depressive symptoms, and behavior problems in preschools of adolescent mothers. *Developmental Psychology, 32*(2), 280-288.
- Leadbeater, B. J., Kuperminc, G. P., Blatt, S. J., & Hertzog, C. (1999). A multivariate model of gender differences in adolescents' internalizing and externalizing problems. *Developmental Psychology, 35*(5), 1268-1282.
- LeCroy & Milligan Associates, Inc. (2010). *Healthy Families Arizona Annual Evaluation Report 2010*. Tucson, AZ: LeCroy & Milligan Associates, Inc. Retrieved from https://www.azdes.gov/InternetFiles/Reports/pdf/healthy_family_annual_evaluation_report_2010.pdf.
- Lee, B. J., & Goerge, R. M. (1999). Poverty, Early childbearing, and child maltreatment: A multinomial analysis. *Children and Youth Services Review, 21*(9/10), 755-780.
- Lee, Y. (2009). Early motherhood and harsh parenting: The role of human, social, and cultural capital. *Child Abuse & Neglect, 33*, 625-637.

- Lennon, M. C., Blome, J., & English, K. (2001). *Depression and low-income women: Challenges for TANF and welfare-to-work policies and programs*. New York, NY: National Center for Children in Poverty, Columbia University.
- Leschied, A.W., Chiodo, D., Whitehead, P.C., & Hurley, D. (2005). The relationship between maternal depression and child outcomes in a child welfare sample: Implications for treatment and policy. *Child and Family Social Work, 10*, 281-291.
- Lesser, J., & Koniak-Griffin, D. (2000). The impact of physical or sexual abuse on chronic depression in adolescent mothers. *Journal of Pediatric Nursing, 15*(6), 378-387.
- Li, D., Liu, L., & Odouli, R. (2009). Presence of depressive symptoms during early pregnant and the risk of preterm delivery: A prospective cohort study. *Human Reproduction, 24*(1), 146-153.
- Lindhorst, T., & Oxford, M. (2008). The long-term effects of intimate partner violence on adolescent mothers' depressive symptoms. *Social Science & Medicine, 66*, 1322-1333.
- Little, T. D. (2013). *Longitudinal Structural Equation Modeling*. New York, NY: Guilford Press.
- Little, T. D., & Rhemtulla, M. (2014). Planned missing data designs for developmental researchers. *Child Development Perspectives, 7*(4), 199-204.
- Little, T. D., Slegers, D. W., & Card, N. A. (2006). A non-arbitrary method of identifying and scaling latent variables in SEM and MACS models. *Structural Equation Modeling, 13*(1), 59-72.
- Logsdon, M.C., Simpson, T., Birkimer, J. E., & Looney, S. (2005). Postpartum depression and social support in adolescents. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 34*(1), 46-54.

- Lok, S. M. & McMahon, C. A. (2006). Mothers' thoughts about their children: Links between mind-mindedness and emotional availability. *British Journal of Developmental Psychology, 24*, 477-488.
- Lovejoy, M. C., Graczyk, P. A. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Child Psychology Review, 29*(5), 561-592.
- Lounds, J. J., Borkowski, J. G., & Whitman, T. L. (2006). The potential for child neglect: The case of adolescent mothers and their children. *Child Maltreatment, 11*(3), 281-294.
- Lundy, B. L. (2003). Father and mother-infant face-to-face interactions: Differences in mind-related comments and infant attachment? *Infant Behavior & Development, 26*, 200-212.
- Luoma, I., Tamminen, T., Kaukonen, P., Laippala, P., Puura, K., Salmelin, R., & Almqvist, F. (2001). Longitudinal study of maternal depression symptoms and child well-being. *Journal of American Academy of Child and Adolescent Psychiatry, 40*, 1367-1374.
- Luster, T. (1998). Individual differences in the caregiving behavior of teenage mothers: An ecological perspective. *Clinical Child Psychology and Psychiatry, 3*(3), 341-360.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*(3), 543-562.
- Lyons S.J., Henly J.R., & Schuerman, J.R. (2005). Informal support in maltreating families: Its effect on parenting practices. *Children and Youth Services Review, 27*, 21-38.
- Lyons-Ruth, K., Lyubchik, A., Wolfe, R., Bronfman, E. (2002). Parental depression and child attachment: Hostile and helpless profiles of parent and child behavior among families at risk. In S., Goodman, & I. Gotlib (Eds.), *Children of depressed parents: Alternative pathways to risk for Psychopathology*, (pp. 89-121). Washington, D. C.: American Psychological Association Press.

- Lyons-Ruth, K., Wolfe, R., & Lyubchik, A. (2000). Depression and the parenting of young children: Making the case for early preventative mental health services. *Harvard Review Psychiatry, 8*, 148-153.
- Malekpour, M. (2007). Effects of attachment on early and later development. *The British Journal of Developmental Disabilities, 53*(105), 81-95.
- Malo, C., Moreau, J., Chamberland, C., Leveille, S., & Roy, C. (2004). Parental cognition, emotions, and behaviors associated with the risk of psychological maltreatment of preschoolers. *Journal of Emotional Abuse, 4*(2), 1-26.
- Mammen, O., Kolko, D., & Pilkonis, P. (2003). Parental cognitions and satisfaction: Relationship to aggressive parental behavior in child physical abuse. *Child Maltreatment, 8*(4), 288-301.
- Manly, J. T., Kim, J. E., Rogosch, F. A., & Cicchetti, D. (2001). Dimensions of child maltreatment and children's adjustment: Contributions of developmental timing and subtype. *Development and Psychopathology, 13*, 759-782.
- Mannarino, A. P., Cohen, J. A., Deblinger, E., & Steer, R. (2007). Self-reported depression in mothers of children who have experienced sexual abuse. *Journal of Psychopathology and Behavior Assessment, 29*, 203-210.
- Marcenko, M. O., Lyons, S. J., & Courtney, M. (2011). Mothers' experiences, resources and needs: The context for reunification. *Children and Youth Services Review, 33*(3), 431-438.
- Marshall, D. B., & English, D. J. (1999). Survival analysis of risk factors for recidivism in child abuse and neglect. *Child Maltreatment, 4*(4), 287-296.

- Martin, A., Gardner, M., & Brooks-Gunn, J. (2011). The mediated and moderated effects of family support on child maltreatment. *Journal of Family Issues, 33*(7), 920-941.
- Mayers, H. A., Hager-Budney, M., & Buckner, E. B. (2008). The Change for Children Teen Parent-Infant Project: Results of a pilot intervention for teen mothers and their infants in inner city high schools. *Infant mental health Journal, 29*(4), 320-342.
- McDowell, D. J. & Parke, R. D. (2005). Parental control and affect as predictors of children's display rule use and social competence with peers. *Social Development, 14*, 440-457.
- Mcfadden, K. E., & Tamis-LeMonda, C. S. (2013). Maternal responsiveness, intrusiveness, and negativity during play with infants: Contextual associations and infant cognitive status in a low-income sample. *Infant Mental Health Journal, 34*(1), 80-92.
- McLearn, KT., Minkovitz, CS., Strobino, D. M., Marks, E., & Hou, W. (2006). The timing of maternal depressive symptoms and mothers' parenting practices with young children: Implications for pediatric practice. *Pediatrics, 118*(1), e172-e182.
- McMahon, C. A., & Meins, E. (2012). Mind-mindedness, parenting stress, and emotional availability in mothers of preschoolers. *Early Childhood Research Quarterly, 27*, 245-252.
- Meade, C. S., Ickovics, J. R., & Kershaw, T. S. (2008). The intergenerational cycle of teen motherhood: An ecological approach. *Health Psychology, 27*(4), 419-429.
- Meins, E. (1997). *Security of attachment and the social development of cognition*. Hove: Psychology Press.
- Meins, E. (1999). Sensitivity, security, and internal working models: Bridging the transmission gap. *Attachment & Human Development, 1*(3), 325-342.

- Meins, E., & Fernyhough, C. (2010). *Mind-mindedness coding manual, Version 2.0*.
Unpublished manuscript. Durham, UK: Durham University.
- Meins, E., Fernyhough, C., Arnott, B., Turner, M. & Leekam, S. R. (2011). Mother versus infant-centered correlates of maternal mind-mindedness in the first year of life. *Infancy*, *16*(2), 137-165.
- Meins, E., Fernyhough, C., De Rosnay, M., Arnott, B., Leekam, S. R. & Turner, M. (2012). Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant-mother attachment in a socially diverse sample. *Infancy*, *17*(4), 393-415.
- Meins, E., Fernyhough, C., Fradley, E. & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry*, *42*(5), 637-648.
- Meltzer-Brody, S., Bledsoe-Mansori, S. E., Jonson, M., Killian, C., Hamer, R., M., Jackson, C., ...Thorp, J. (2013). A prospective study of perinatal depression and trauma history in pregnant minority adolescents. *American Journal of Obstetrics & Gynecology*, *208*, e1-e7.
- Mennen, F.E. & Trickett, P.K. (2011). Parenting Attitudes, Family Environments, Depression, and Anxiety in Caregivers of Maltreated Children. *Family Relations*, *60*(3), 259-271.
- Middlemiss, W. & McGuigan, (2005) W. M. Ethnic Differences in the Benefits of Home Visiting Services for Adolescent Mothers. *Family Relations*, *54*, 212-224.
- Milette, K., Hudson, M., Baron, M., & Thombs, B. D. (2010). Comparison of the PHQ-9 and CES-D depression scales in systemic sclerosis: internal consistency reliability, convergent validity and clinical correlates. *Rheumatology*, *49*(4), 789-796.

- Milgrom, J., Gemmill, A. W., Bilszta, J. L., Hayes, B., Barnett, B., Brooks, J...Buist, A. (2008). Antenatal risk factors for postnatal depression: A large prospective study. *Journal of Affective Disorders, 108*(1-2), 147-157.
- Miller, B. C., Benson, B., & Galbraith, K. A. (2001). Family relationships and adolescent pregnancy risk: A research synthesis. *Developmental Review, 21*(1), 1-38.
- Miller, C. L., Miceli, P. J., Whitman, T. L., & Borkowski, J. G. (1996). Cognitive readiness to parent and intellectual-emotional development in children of adolescent mothers. *Developmental Psychology, 32*(3), 533-541.
- Minkovitz, C. S., Strobino, D., Scharfstein, D., Hou, W., Miller, T., Mistry, K. B., & Swartz, K. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. *Pediatrics, 115*(2), 306-314.
- Mitchell, W., & Green, E. (2002). 'I don't know what I'd do without our mam': Motherhood, identity and support networks. *The Sociological Review, 50*(1), 1-22.
- Mitchell-Herzfeld, S., Izzo, C., Greene, R., Lee, E., & Lowenfels, A. (2005). *Evaluation of Healthy Families New York (HFNY): First year program impacts*. Rensselaer, NY: New York State Office of Children & Family Services. Retrieved from http://ocfs.ny.gov/main/reports/HFNY_FirstYearProgramImpacts.pdf.
- Mollborn, S., & Morningstar, E. (2009). Investigating the relationship between teenage childbearing and psychological distress using longitudinal evidence. *Journal of Health and Social Behavior, 50*(3), 310-326.
- Moore, M. R., & Brooks-Gunn, J. (2002). Adolescent parenthood. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 3: Being and becoming a parent* (2nd ed.), (pp. 173-214). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

- Munz, E. A., Wilson, S. R., & D'Enbeau, S. (2010). The reach of child abuse potential: Its relationship with features of parenting at home. *Journal of Family Communication, 10*(4), 256-277.
- Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child Development, 67*(5), 2512-2526.
- Mustillo, S. A., Dorsey, S., Conover, K., & Burns, B. J. (2011). Caregiver depression and child mental health: The developmental effects of parenting. *Journal of Marriage and Family, 73*, 164-180.
- Muthén, B., & Asparouhov, T. (2006). Item response mixture modeling: Application to tobacco dependence criteria. *Addictive Behaviors, 31*, 1050-1066.
- Mylod, D. E., Whitman, T. L., & Borkowski, J. D. (1997). Predicting adolescent mothers' transition to adulthood. *Journal of Research on Adolescence, 7*, 457-478.
- Nadeem, E., Whaley, S. E., & Anthony, S. (2006). Characterizing low-income Latina adolescent mothers: Living arrangements, psychological adjustment, and use of services. *Journal of Adolescent Health, 38*(1), 68-71.
- Nair, P., Schuler, M. E., Black, M. M., Kettinger, L., & Harrington, D. (2003). Cumulative environmental risk in substance abusing women: Early intervention, parenting stress, child abuse potential and child development. *Child Abuse & Neglect, 27*, 997-1017.
- National Research Council and Institute of Medicine. (2009). *Depression in Parents, Parenting, and Children: Opportunities to Improve Identification, Treatment, and Prevention*. Washington, DC: The National Academies Press.

- National Scientific Council on the Developing Child. (2007). *The science of early childhood development*. Retrieved from <http://www.developingchild.net>.
- Nguyen, J. D., Carson, M. L., Parris, K. M., & Place, P. (2003). A comparison pilot study of public health field nursing home visitation program intervention for pregnant Hispanic adolescents. *Public Health Nursing, 20*(5), 412-418.
- NICHHD Early Child Care Research Network. (1999). Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. *Developmental Psychology, 35*(5), 1297-1310.
- Nievar, M.A., Van Egeren, L.A. & Pollard, S. (2010). A meta-analysis of home visiting programs: Moderators for improvements in maternal behavior. *Infant Mental Health Journal, 31*(5), 499-520.
- O'Callaghan, M. F., Borkowski, J. G., Whitman, T. L., Maxwell, S. E. & Keogh, D. (1999). A model of adolescent parenting: The role of cognitive readiness to parent. *Journal of Research on Adolescence, 9*(2), 203-225.
- O'Connor, T. G., Monk, C., & Fitelson, E. M., (2013). Practitioner review: Maternal mood in pregnancy and child development - implications for child psychology and psychiatry. *The Journal of Child Psychology and Psychiatry, 55*(2), 99-111.
- O'Hara, M. W. (1997). The nature of postpartum depressive disorders. In P. J. Cooper & L. Murray (Eds.), *Postpartum: Depression and child development* (pp. 3-31). New York, NY: Guilford Press.
- Oberlander, S. E., Black, M. M., & Starr, R. H. (2007). African American adolescent mothers and grandmothers: A multigenerational approach to parenting. *American Journal of Community Psychology, 39*(1-2), 37-46.

- Olds, D. L., & Kitzman, H. (1993). Review of research on home visiting for pregnant women and parent of young children. *The Future of Children, 3*(3), 53-92.
- Olds, D. L., Kitzman, H., Hanks, C., Cole, R., Anson, E., Sidora-Arcoleo, K...Bondy, J. (2007). Effects of nurse home visiting on maternal and child functioning: Age-9 follow-up of a randomized trial. *Pediatrics, 120*(4), e832-e845.
- Pacheco, A., & Figueiredo, B. (2012). Mother's depression at childbirth does not contribute to the effects of antenatal depression on neonate's behavioral development. *Infant Behavior and Development, 35*, 513-522.
- Pajulo, M., Pyykkonen, N., Kalland, M., Sinkkonen, J., Helenius, H., Punamaki, R., & Suchman, N. (2012). Substance-abusing mothers in residential treatment with their babies: Importance of pre- and postnatal maternal reflective functioning. *Infant Mental Health Journal, 33*(1), 70-81.
- Panzarine, S., Slater, E., & Sharps, P. (1995). Coping, social support, and depressive symptoms in adolescent mothers. *Journal of Adolescent Health, 17*, 113-119.
- Paulson, J. F., Dauber, S., & Leiferman, J. A. (2006). Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. *Pediatrics, 2*(1), 659-668.
- Pawlby, S., Fernyhough, C., Meins, E., Pariante, C. M., Seneviratne, G., & Bentall, R. P. (2010). Mind-mindedness and maternal responsiveness in infant-mother interactions in mothers with severe mental illness. *Psychological Medicine, 40*(11), 1861-1869.
- Pelaez, M., Field, T., Pickens, J. N., & Hart, S. (2008). Disengaged and authoritarian parenting behavior of depressed mothers with their toddlers. *Infant Behavior & Development, 31*, 145-148.

- Phipps, M. G., Blume, J. D., & DeMonner, S. M. (2002). Young maternal age associated with increased risk of postneonatal death. *Obstetrics & Gynecology, 100*(3), 481-486.
- Pierce, G. R., Sarason, I. G., Sarason, B. R., Solky-Butzel, J. A., & Nagle, L. C. (1997). Assessing the quality of personal relationships. *Journal of Social and Personal Relationships, 14*(3), 339-356.
- Pierce, G. R., Sarason, I. G., & Sarason, B. R. (1991). General and relationship-based perceptions of social support: are two constructs better than one? *Journal of Personality and Social Psychology, 61*, 1028-1039.
- Proctor, L. J., Aarons, G. A., Dubowitz, H., English, D. J., Lewis, T., Thompson, R...Roesch, S. C. (2012). Trajectories of maltreatment re-reports from ages 4 to 12: Evidence for persistent risk after early exposure. *Child Maltreatment, 17*(3), 207-217.
- Putnam-Hornstein, E., Simon, J. D., Eastman, A. L., & Magruder, J. (2014). Risk of re-reporting among infants who remain at home following alleged maltreatment. *Child Maltreatment*. Retrieved from cmx.sagepub.com.
- Quinlivan, J. A. Luehr, B., & Evans, S. F. (2004). Teenage mother's predictions of their support levels before and actual support levels after having a child. *Journal of Pediatric and Adolescent Gynecology, 17*, 273-278.
- Radloff, L. S. (1977). The CES-D Scale: A Self-Report Depression Scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.
- Radloff, L. S. (1991). The use of the center for epidemiologic studies depression scale in adolescents and young adults. *Journal of Youth and Adolescence, 20*(2), 149-166.
- Radloff, L.S., & Locke, B. Z. (1986). The community mental health assessment survey and the CES-D scale. In M. M. Weissman, J. K. Myers, & C. E. Ross (Eds.), *Community surveys*

- of psychiatric disorders: Series in psychosocial epidemiology* (Vol. 4, pp. 177-189). New Brunswick, NJ: Rutgers University Press.
- Ramos-Marcuse, F., Oberlander, S. E., Papas, M. A., McNary, S. W., Hurley, K. M., & Black, M. M. (2010). Stability of maternal depressive symptoms among urban, low-income African American adolescent mothers. *Journal of Affective Disorder, 122*, 68-75.
- Reiner, I., Beutel, M., Skaletz, C., Brähler, E., & Stöbel-Richter, Y. (2012). Validating the German version of the Quality of Relationship Inventory: Confirming the three-factor structure and report of psychometric properties. *PLoS ONE 7*(5): e37380.
- Rhule, D. M., McMahon, R. J., Spieker, S. J., & Munson, J. A. (2006). Positive adjustment and associated protective factors in children of adolescent mothers. *Journal of Child and Family Studies, 15*(2), 231-251.
- Robertson, E., Grace, S., Wallington, T., & Stewart, D. E. (2004). Antenatal risk factors for postpartum depression: A synthesis of recent literature. *General Hospital Psychiatry, 26*(4), 289-295.
- Rodriguez, C. M. (2010). Parent-child aggression: Association with child abuse potential and parenting styles. *Violence and Victims, 25*(6), 728-741.
- Rodriguez, C. M., Russa, M. B., & Harmon, N. (2011). Assessing abuse risk beyond self-report: Analog task of acceptability of parent-child aggression. *Child Abuse & Neglect, 35*, 199-209.
- Rogosch, F. A., Cicchetti, D., Shields, A. & Toth, S. L. (1995). Parenting dysfunction in child maltreatment. In M.H. Bornstein (Ed.), *Handbook of parenting: Vol. 4. Applied and practical parenting*, (pp.127-159). New Jersey: Lawrence Erlbaum Associates, Publishers.

- Ruttenberg, W. B., Finello, K. M., & Cordeiro, A. K. (1997). Interactions between depressed and nondepressed Latina mothers and their premature infants. *Infant Mental Health Journal*, 18(4), 364-377.
- Sackett, D. L., Strauss, S. E., Richardson, W. C., Rosenberg, W., & Haynes, R. (2000). *Evidence-based medicine: How to practice and teach EBM*. New York: Churchill.
- Sadler, L. S., Slade, A., Close, N., Webb, D. L., Simpson, T., Fennie, K. & Mayes, L. C. (2013). Minding the baby: Enhancing reflectiveness to improve early health and relationship outcomes in an interdisciplinary home-visiting program. *Infant Mental Health Journal*, 34(5), 391-405.
- Samuels, V. J., Stockdale, D. F., & Crase, S. J. (1994). Adolescent mothers' adjustment to parenting. *Journal of Adolescence*, 17(5), 427-443.
- Schechter, D. S., Myers, M. M., Brunelli, S. A., Coates, S. W., Zeanah, C. H., Davies, M., & Liebowitz, M. R. (2006). Traumatized mothers can change their minds about their toddlers: Understanding how a novel use of video feedback supports positive change of maternal attributions. *Infant Mental Health Journal*, 27(5), 429-447.
- Schellenbach, C. J., Whitman, T. L., & Borkowski, J. G. (1992). Toward an integrative model of adolescent parenting. *Human Development*, 35, 81-99.
- Schetter, C. D., & Tanner, L. (2012). Anxiety, depression and stress in pregnancy: Implications for mothers, children, research, and practice. *Current Opinion in Psychiatry*, 25(2), 141-148.
- Schmidt, R. M., Wiemann, C. M., Rickert, V. I., & Smith, E. O. (2006). Moderate to severe depressive symptoms among adolescent mothers followed four years postpartum. *Journal of Adolescent Health*, 38(6), 712-718.

- Schuetze, P., & Eiden, R. D. (2005). The relationship between sexual abuse during childhood and parenting outcomes: Modeling direct and indirect pathways. *Child Abuse & Neglect, 29*, 645-659.
- Sedlak, A.J., Mettenburg, J., Basera, M., Petta, I., McPherson, K., Greene, A., & Li, S. (2010). *Fourth National Incidence Study of Child Abuse and Neglect (NIS-4): Report to Congress*. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families. Retrieved from http://www.acf.hhs.gov/sites/default/files/opre/nis4_report_congress_full_pdf_jan2010.pdf.
- Sellers, K., Black, M. M., Boris, N. W., Oberlander, S. E., & Myers, L. (2011). Adolescent mothers' relationships with their own mothers: Impact on parenting outcomes. *Journal of Family Psychology, 25*(1), 117-126.
- Seymore, C., Frothingham, T. E., Macmillan, J., & Durant, R. H. (1990). Child development knowledge, childrearing attitudes, and social support among first- and second-time adolescent mothers. *Journal of Adolescent Health Care, 11*(4), 343-350.
- Shahar, G. (2001). Maternal personality and distress as predictors of child neglect. *Journal of Research in Personality, 35*(4), 537-545.
- Shapiro, J. R., & Mangelsdorf, S. C. (1994). The determinants of parenting competence in adolescent mothers. *Journal of Youth and Adolescence, 23*(6), 621-641.
- Sharp, C. & Fonagy, P. (2007). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development, 17*(3), 737-754.

- Shaw, E., Levitt, C., Wong, S., Kaczorowski, J., & The McMaster University Postpartum Research Group. (2006). Systematic review of the literature on postpartum care: Effectiveness of postpartum support to improve maternal parenting, mental health, quality of life and physical health. *Birth, 33*(3), 210-220.
- Shay, N. L., & Knutson, J. F. (2008). Maternal depression and trait anger as risk factors for escalated physical discipline. *Child Maltreatment, 13*(1), 39-49.
- Sheppard, M. (1997). Double jeopardy: The link between child abuse and maternal depression in child and family social work. *Child and Family Social Work, 2*, 91-107.
- Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *Journal of American Medical Association, 301*(21), 2252-2259.
- Sidebotham, P., & Golding, J. (2001). Child maltreatment in the “children of the nineties”: A longitudinal study of parental risk factors. *Child Abuse & Neglect, 25*, 1177-1200.
- Sidor, A., Kunz, E., Schweyer, D., Eickhorst, A., & Cierpka, M. (2011). Links between maternal postpartum depressive symptoms, maternal distress, infant gender, and sensitivity in a high-risk population. *Child and Adolescent Psychiatry and Mental Health, 5*(7), 1-7.
- Silver, E. J., Heneghan, A. M., Bauman, L. J., & Stein, R. E. K. (2006). The relationship of depressive symptoms to parenting competence and social support in inner-city mothers of young children. *Maternal and Child Health Journal, 10*(1), 105-112.
- Slack, K. S., Berger, L. M., DuMont, K., Yang, M., Kim, B., Ehrhard-Dietzel, S., & Holl, J. L. (2011). Risk and protective factors for child neglect during early childhood: A cross-study comparison. *Children & Youth Services Review, 33*, 1354-1363.

- Slack, K. S., Holl, J. L., McDaniel, M., Yoo, J., & Bolger, K. (2004). Understanding the risks of child neglect: An exploration of poverty and parenting characteristics. *Child Maltreatment, 9*(4), 395-408.
- Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development, 7*(3), 269-281.
- Slade, A., Belsky, J., Aber, J. L. & Phelps, J. L. (1999). Maternal representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology, 35*, 611-619.
- Slade, A., Bernbach, E., Grienenberger, J., Levy, D. & Locker, A. (2004). *Addendum to Fonagy, Target, Steele & Steel reflecting functioning scoring manual for use with the Parent Development Interview*. Unpublished Manuscript. New York, NY: The City College and Graduate Center of the City University of New York.
- Slade, A., Grienenberger, J., Bernbach, E., Levy, D., & Locker, A. (2005). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment & Human Development, 7*(3), 283-298.
- Smith, C. (1996). The link between childhood maltreatment and teenage pregnancy. *Social Work Research, 20*(3), 131-141.
- Soderstrom, K., & Skarderud, F. (2009). Minding the baby: Mentalization-based treatment in families with parental substance use disorder: Theoretical framework. *Nordic Psychology, 61*(3), 47-65.
- Sohr-Preston, S. L., & Scaramella, L. V. (2006). Implications of timing of maternal depressive symptoms for early cognitive and language development. *Clinical Child and Family Psychology Review, 9*(1), 65-83.

Sommer, K., Whitman, T. L., Borkowski, J. G., Schellenbach, C., Maxwell, S. & Keogh, D.

(1993). Cognitive readiness and adolescent parenting. *Developmental Psychology*, 29(2), 389-398.

Soni, A. (2009). The five most costly conditions, 1996 and 2006: Estimates for the U.S. Civilian Noninstitutionalized population. Statistical Brief #248. Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from

http://meps.ahrq.gov/mepsweb/data_files/publications/st248/stat248.pdf.

Spieker, S. J., Gillmore, M. R., Lewis, S. M., Morrison, D. M. & Lohr, M. J. (2001).

Psychological distress and substance use by adolescent mothers: associations with parenting attitudes and the quality of mother-child interaction. *Journal of Psychoactive Drugs*, 33, 83-93.

Sroufe, A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, 7(4), 349-367.

Steinberg, L., & Scott, E. S. (2003). Less guilty by reason of adolescence: Developmental immaturity, diminished responsibility, and the juvenile death penalty. *American Psychologist*, 58(12), 1009-1018.

Stevens, J., Ammerman, R. T., Putnam, F. G., & Van Ginkel, J. B. (2002). Depression and trauma history in first-time mothers receiving home visitation. *Journal of Community Psychology*, 30(5), 551-564.

Stevens, J., Ammerman, R.T., Putnam, F.W., Gannon, T.A., & Van Ginkel, J.B. (2005).

Facilitators and barriers to engagement in home visitation: A qualitative analysis of maternal, provider, and supervisor data. *Journal of Aggression, Maltreatment, and Trauma*, 11, 75-93.

- Stevenson, W., Maton, K. I., & Teti, D. M. (1999). Social support, relationship quality, and well-being among pregnant adolescents. *Journal of Adolescence*, 22(1), 109-121.
- Stevens-Simon, C., & Barrett, J. (2001). A comparison of the psychological resources of adolescents at low and high risk of mistreating their children. *Journal of Pediatric Health Care*, 15, 299-303.
- Stevens-Simon, C., Nelligan, D., & Kelly, L. (2001a). Adolescent at risk for mistreating their children Part II: A home- and clinic-based prevention program. *Child Abuse & Neglect*, 6, 753-769.
- Stier, D. M., Leventhal, J. M., Berg, A. T., Johnson, L., & Mezger, J. (1993). Are children born to young mothers at increased risk of maltreatment? *Pediatrics*, 91(3), 642-648.
- Stirtzinger, R., McDermid, S., Grusec, J., Bernardini, S., Quinlan, K., & Marshall, M. (2002). Interrupting the intergenerational cycle in high risk adolescent pregnancy. *The Journal of Primary Prevention*, 23(1), 7-22.
- Stith, S. M., Liu, T., Davies, C., Boykin, E. L., Alder, M. C., Harris, J. M...Dees, J. E. M. E. G. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior*, 14, 13-29.
- Sutter-Dallay, A. L., Cosnefroy, O., Glatigny-Dallay, E., & Verdoux, H. (2012). Evolution of perinatal depressive symptoms from pregnancy to two years postpartum in a low-risk sample: The MATQUID cohort. *Journal of Affective Disorder*, 139(1), 23-29.
- Sweet, M. A., & Appelbaum, M. I. (2004). Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Development*, 75(5), 1435-1456.

- Tamis-LeMonda, C. S., Shannon, J., & Spellmann, M. (2002). Low income adolescent mothers' knowledge about domains of child development. *Infant Mental Health Journal, 23*(1-2), 88-103.
- Tandon, S. D., Parillo, K. M., Jenkins, C. J., & Duggan, A. K. (2005). Home visitors' recognition of and response to malleable risk factors among low-income pregnant and parenting women. *Maternal and Child Health Journal, 9*, 273-283.
- Tandon, S. D., Parillo, K. M., Mercer, C., Keefer, M., & Duggan, A. K. (2008). Engagement in paraprofessional home visitation: Families' reasons for enrollment and program response to identified reasons. *Womens Health Issues, 19*(2), 118-129.
- Tandon, S. D., Perry, D. F., Mendelson, T., Kemp, K., & Leis, J. A. (2011). Preventing perinatal depression in low-income home visiting clients: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 79*(5), 707-712.
- Thombs, B. D., Hudson, M., Schieir, O., Taillefer, S. S., Baron, M., & The Canadian Scleroderma Research Group. (2008). Reliability and validity of the center for epidemiologic studies depression scale in patients with systemic sclerosis. *Arthritis Care & Research, 59*(3), 438-443.
- Trapolini, T., Ungerer, J. A., & McMahon, C. A. (2008). Maternal depression: Relations with maternal caregiving representations and emotional availability during the preschool years. *Attachment & Human Development, 10*(1), 73-90.
- Tronick, E. Z. (2006). The inherent stress of normal daily life and social interaction leads to the development of coping and resilience, and variation in resilience in infants and young children. *Annual New York Academy of Science, 1094*, 83-104.

- Tufts Interdisciplinary Evaluation Research. (2013). *The Massachusetts Health Families Evaluation-2 (MHFE-2): A randomized controlled trial of a statewide home visiting program for young parents. Progress report to the Massachusetts Children's Trust Fund, Fiscal Year 2013*. Medford, MA: Tufts University.
- Tufts Interdisciplinary Evaluation Research. (2014). *The Massachusetts Health Families Evaluation-2 (MHFE-2): A randomized controlled trial of a statewide home visiting program for young parents. Final report to the Children's Trust of Massachusetts*. Medford, MA: Tufts University.
- Tyler, S., Allison, K., Winsler, A. (2006). Child neglect: Developmental consequences, intervention, and policy implications. *Child & Youth Care Forum*, 35(1), 1-20.
- Tzilos, G., Zlotnick, C., Raker, C., Kuo, C, Phipps, M. (2012). Psychosocial factors associated with depression severity in pregnant adolescents. *Archives of Women's Mental Health*, 15, 397-401.
- U.S. Department of Health and Human Services Administration for Children and Families. (2015). *Child Maltreatment 2013*. Retrieved from <http://www.acf.hhs.gov/programs/cb/resource/child-maltreatment-2013>.
- U.S. Department of Health and Human Services. (2010). Maternal, infant, and early childhood home visiting program. Retrieved from <http://mchb.hrsa.gov/programs/homevisiting/index.html>.
- U.S. Department of Health and Human Services. (2013, September 6). HHS announces expansion of Maternal, Infant, and Early Childhood Home Visiting. Retrieved from <http://www.hhs.gov/news/press/2013pres/09/20130906a.html>.

- Unger, D. G., & Cooley, M. (1992). Partner and grandmother contact in Black and White teen parent families. *Journal of Adolescent Health, 13*(7), 546–552.
- Unger, D. G., & Wandersman, L. P. (1988). The relation of family and partner support to the adjustment of adolescent mothers. *Child Development, 59*(4), 1056-1060.
- Vasta, R. (1982). Physical child abuse: A dual-component analysis. *Developmental Review, 2*(2), 125-149.
- Verhofstadt, L. L., Buysse, A., Rosseel, Y., & Peene, O. J. (2006). Confirming the three-factor structure of the Quality of Relationships Inventory within couples. *Psychological Assessment, 18*(1), 15-21.
- Wagner, M. M., & Clayton, S. L. (1999). The Parents as Teachers program: Results from two demonstrations. *The Future of Children, 9*(1), 91-115.
- Walker, T. M., Wheatcroft, R., & Camic, P. M. (2011). Mind-mindedness in parents of preschoolers: A comparison between clinical and community samples. *Clinical Child Psychology and Psychiatry, 17*(3), 318-335.
- Wang, C. T., & Holton, J. (2007). *Total estimated cost of child abuse and neglect in the United States*. Chicago, IL: Prevent Child Abuse America.
- Wang, L., Wu, T., Anderson, J. L., & Florence, J. E. (2011). Prevalence and risk factors of maternal depression during the first three years of child rearing. *Journal of Womens Health, 20*(5), 711-718.
- Weed, K., Keogh, D., & Borkowski, J. (2006). Stability of resilience in children of adolescent mothers. *Applied Developmental Psychology, 27*, 60-77.

- Weinberg, M.K., Tronick, E.Z., Beeghly, M., Olson, K.L., Kernan, H., Riley, J.M. (2001). Subsyndromal depressive symptoms and major depression in postpartum women. *American Journal of Orthopsychiatry*, 71, 87-97.
- Weissman, M. M., Feder, A., Pilowsky, D. J., Olfson, M., Fuentes, M., Blanco, C...Shea, S. (2004). Depressed mothers coming to primary care: Maternal reports of problems with their children. *Journal of Affective Disorders*, 78, 93-100.
- Werner, E. E. (2005). Resilience research: Past, present, and future. IN R. D. V. Peters, B. Leadbeater, & R. J., McMahon (Eds.), *Resilience in children, families, and communities*, (pp.3-12). NY: Kluwer.
- Whitman, T. L., Borkowski, J. G., Keogh, D. A., & Weed, K. (2001). *Interwoven lives: Adolescent mothers and their children*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Whitson, M. L., Martinez, A., Ayala, C., & Kaufman, J. S. (2011). Predictors of parenting and infant outcomes for impoverished adolescent parents. *Journal of Family Social Work*, 14(4), 284-297.
- Widaman, K. F. (2006). Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development*, 71(3), 42-64.
- Windham, A. M., Rosenberg, L., Fuddy, L., McFarlane, E., Sia, C., & Duggan, A. K. (2004). Risk of mother-reported child abuse in the first 3 years of life. *Child Abuse & Neglect*, 28, 645-667.
- Wisner, K., Sit, D. K. Y., McShea, M. C., Rizzo, D. M., Zoretich, R. A., Hughes, C. L.,...Hanusa, B. H. (2013). Onset timing, thoughts of self-harm, and diagnoses in

- postpartum women with screen-positive depression findings. *The Journal of American Medical Association Psychiatry*, 70(5), 490-498.
- Wulczyn, F., Barth, R., Yuan, Y. Y., Harden, B. J., & Landsverk, J. (2005). *Beyond common sense: Child welfare, child well-being, and the evidence for policy reform*. New Brunswick, NJ: Aldine Transaction.
- Yozwiak, J. A. (2010). Postpartum depression and adolescent mothers: A review of assessment and treatment approaches. *Journal of Pediatric & Adolescent Gynecology*, 23, 172-178.
- Yuan, Y. Y., Schene, P., English, D., & Johnson, C. (2005, April). *Whether substantiation? The role of substantiation in future child protective service policies and practice*. Presentation at the 15th National Conference on Child Abuse and Neglect, Boston, MA.
- Zajicek-Farber, M. L. (2009). Postnatal depression and infant health practices among high risk women. *Journal of Child and Family Studies*, 18, 236-245.
- Zelenko, M. A., Huffman, L., Lock, J., Kennedy, Q., & Steiner, H. (2001). Poor adolescent expectant mothers: Can we assess their potential for child abuse? *Journal of Adolescent Health*, 29(4), 271-278.
- Ziv, Y., Aviezer, A., Gini, M., Sagi, A., & Koren-Karie, N. (2000). Emotional availability in the mother-infant dyad as related to the quality of infant-mother attachment relationship. *Attachment & Human Development*, 2(2), 149-169.
- Zuckerman, B., Bauchner, J., Parker, S., & Cabral, J. (1990). Maternal depressive symptoms during pregnancy and newborn irritability. *Journal do Developmental & Behavioral Pediatrics*, 11(4), 190-194.
- Zuravin, S. J. (1989). Severity of maternal depression and three types of mother-to-child aggression. *American Journal of Orthopsychiatry*, 59(3), 377-389.

- Zuravin, S. J., & DiBlasio, F. A. (1992). Child-neglecting adolescent mothers: How do they differ from their nonmaltreating counterparts? *Journal of Interpersonal Violence, 7*(4), 471-489.
- Zuravin, S. J., & DiBlasio, F. A. (1996). The correlates of child physical abuse and neglect by adolescent mothers. *Journal of Family Violence, 11*(2), 149-166.
- Zuravin, S.J., Bliss, D.L., & Cohen-Callow, A. (2005). Maternal depression and adverse parenting. In K.A. Kendall-Tackett and S.M. Giacomoni (Eds.), *Child Victimization: Maltreatment, Bullying and Dating Violence, Prevention and Intervention*, (pp. 101-119). Kingston, NJ: Civic Research Institute.

Table 1

Full Sample Descriptives (N = 508)

	<i>M</i>	<i>SD</i>	%
Maternal age at enrollment	18.6	1.33	
Maternal age at birth	18.79	1.29	
Father age at enrollment	21.01	4.37	
Child age at T2 RI	11.92	5.18	
Program treatment status (HVS)			58.70%
Pregnant at enrollment			69.30%
Mother ethnicity			
White			35.70%
Black			20.30%
Hispanic			36.10%
Other			7.90%
Father ethnicity			
White			26.30%
Black			23.20%
Hispanic			9.90%
Other			40.40%
Mother born in United States			81.20%
Mother born in Massachusetts			68.60%
Baby sex (boy)			52.40%
Income (In thousands)	38	17.88	
Receive welfare (T1)			22.10%
Lives alone			T1: 13.90%
			T2: 15.60%
			T3: 26.10%
Lives with parental figure			T1: 78.20%
			T2: 72.40%
			T3: 56.80%
Lives with father of the baby			T1: 25.90%
			T2: 31.70%
			T3: 25.50%
Maternal education			
In HS/GED			T1: 38.10%
			T2: 26.80%
			T3: 11.10%
Finished HS/GED			T1: 38.90%
			T2: 54.90%
			T3: 72.10%
Dropped out			T1: 23%
			T2: 18.30%
			T3: 16.80%

Relationship status			
Single			T1: 26.90%
			T2: 33.30%
			T3: 26.90%
Dating father of the baby			T1: 16.70%
			T2: 16.60%
			T3: 10.60%
Engaged father of the baby			T1: 45.70%
			T2: 32.50%
			T3: 22.10%
Married father of the baby			T1: 2.90%
			T2: 4.40%
			T3: 6%
Dating other			T1: 3.20%
			T2: 7.20%
			T3: 15.60%
Engaged other			T1: 4.30%
			T2: 5.20%
			T3: 7.50%
Married other			T1: 0.20%
			T2: 0.90%
			T3: 1.30%
Presence of reports before T2			
Yes			20.70%
No, but has report after T2			15.60%
No report			63.80%
Number of child maltreatment reports after T2	0.33	0.69	
Presence of child maltreatment report after T2			
No report			76.80%
Substantiated			13.60%
Unsubstantiated			9.60%
Type of child maltreatment report after T2			
Neglect only			82.20%
Physical abuse only			1.70%
Sexual abuse only			0.80%
Multiple types			15.30%
Perpetrator identity			
Mother (Mother only or in combination with others)			82.10%
Other			17.90%
EA FP sensitivity (T2)	4.83	1.59	
EA TT sensitivity (T2)	4.57	1.33	
EA FP hostility (T2)	4.26	0.93	
EA TT hostility (T2)	3.95	0.99	
MM attuned (T2)	7.63	8.56	
QRI support (T2)	1.73	1.11	

QRI conflict (T2)	1.76	0.73
QRI depth (T2)	1.76	1.11
Duration (Months between enrollment up to T2 intake)	9.56	3.28
Number of groups (between program enrollment up to T2 intake)	1.52	2.3
Number of visits (between program enrollment up to T2 intake)	18.33	10.72
Program intensity (Number of visits per month up to T2intake)	1.67	0.8

Notes. M = Mean; SD = Standard deviation; T1 = Time 1; T2 = Time 2; T3 = Time 3; RI = Research Interview; EA = Emotional Availability; FP = Free play; TT = Teaching task; MM = Mind mindedness; QRI = Quality of Relationships Inventory.

Table 2

*Statistical Details of the Criteria Used to Determine the Most Viable Groupings of Depression**Trajectories (N = 508)*

	3 Group	4 Group	5 Group
AIC	10213.94	10182.91	10126.88
BIC	10273.16	10259.06	10219.95
Sample-Size Adjusted BIC	10228.72	10201.92	10150.12
Entropy	0.74	0.78	0.81
Classification			
Stable-non depressed	316	284	283
Stable-low depressed	154	159	134
Stable-high depressed	38	50	40
Increasing		15	24
Decreasing			27
Average latent class probabilities			
Stable-non depressed	0.93	0.82	0.93
Stable-low depressed	0.9	0.9	0.91
Stable-high depressed	0.82	0.84	0.81
Increasing		0.91	0.82
Decreasing			0.82
LMR	70.24(0.02)*	37.52(0.53)	62.03(0.008)**
BLRT	73.06***	39.03***	64.52***

Notes. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; LMR = Lo-Mendell-Rubin Test; BLRT = Bootstrapped Likelihood Ratio Test.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Depression Trajectory Groups Descriptives (N = 508)

	Stable-non depressed (<i>n</i> = 283) %/M (<i>SD</i>)	Stable-low depressed (<i>n</i> = 134) %/M (<i>SD</i>)	Stable-high depressed (<i>n</i> = 40) %/M (<i>SD</i>)	Increasing (<i>n</i> = 24) %/M (<i>SD</i>)	Decreasing (<i>n</i> = 27) %/M (<i>SD</i>)
Maternal age at enrollment ^a	18.62 (1.33)	18.67 (1.29)	18 (1.12)	18.78 (1.45)	18.88 (1.43)
Maternal age at birth ^a	18.79 (1.31)	18.88 (1.23)	18.13 (1.04)	18.89 (1.38)	19.06 (1.36)
Father age at enrollment	21.09 (4.27)	20.77 (4.44)	21.53 (4.72)	20.17 (3.13)	21.17 (4.68)
Child age at T2	11.8 (5.16)	11.26 (5.1)	13.06 (6.68)	11.6 (4.33)	12.42 (5.55)
Program treatment status (HVS)	58%	63.40%	50%	58.30%	55.60%
Pregnant at enrollment	66.80%	69.30%	75%	75%	77.80%
Mother ethnicity					
White	37.80%	30.60%	37.50%	37.50%	33.30%
Black	21.60%	16.20%	17.50%	29.20%	22.20%
Hispanic	34.30%	42.60%	32.50%	29.20%	37%
Other	6.40%	10.50%	12.50%	4.20%	7.40%
Father ethnicity					
White	27.60%	22.20%	26.60%	29.60%	25.90%
Black	22.50%	22.00%	27.60%	40.30%	25.10%
Hispanic	9.30%	9.90%	12.90%	14.00%	3.50%
Other	40.60%	45.90%	33.00%	16.10%	45.60%
Mother born in United States	81.60%	80.60%	80.00%	87.10%	76.00%
Mother born in Massachusetts	71.00%	62.70%	62.50%	87.50%	65.30%
Baby sex (boy)	53.20%	51.90%	48.50%	58.30%	51.90%
Income (In thousands)	38.477 (18.01)	38.968 (17.58)	33.389 (19.19)	37.348 (19.82)	32.813 (15.93)
Receive welfare (T1)	23.00%	22.80%	22.50%	18.50%	7.90%
Relationship status					
Single	T1: 26.50% T2: 34.90% T3: 35.80%	T1: 25.40% T2: 30.70% T3: 39.30%	T1: 37.50% T2: 30.90% T3: 33.10%	T1: 28.20% T2: 36.40% T3: 37.50%	T1: 25.90% T2: 33.30% T3: 42.60%

Dating father of the baby	T1: 17.30%	T1: 16.50%	T1: 17.50%	T1: 10.40%	T1: 14.40%
	T2: 15.30%	T2: 16.10%	T2: 20.50%	T2: 7.00%	T2: 22.20%
	T3: 9.50%	T3: 10.70%	T3: 5.90%	T3: 29.20%	T3: 11.20%
Engaged father of the baby	T1: 45.10%	T1: 49.60%	T1: 35.00%	T1: 45.20%	T1: 47.30%
	T2: 32.70%	T2: 35.60%	T2: 16.70%	T2: 35.30%	T2: 33.30%
	T3: 22.50%	T3: 20.90%	T3: 20.90%	T3: 8.30%	T3: 29.80%
Married father of the baby	T1: 3.50%	T1: 2.90%	T1: 0.00%	T1: 0.00%	T1: 4.30%
	T2: 5.40%	T2: 4.10%	T2: 0.00%	T2: 0.00%	T2: 7.40%
	T3: 5.40%	T3: 9.10%	T3: 0.00%	T3: 4.20%	T3: 7.70%
Dating other	T1: 3.50%	T1: 3.20%	T1: 2.50%	T1: 0.00%	T1: 3.50%
	T2: 5.60%	T2: 8.50%	T2: 14.70%	T2: 9.70%	T2: 0.00%
	T3: 15.20%	T3: 16.20%	T3: 23.20%	T3: 12.50%	T3: 8.70%
Engaged other	T1: 3.90%	T1: 2.30%	T1: 7.50%	T1: 16.30%	T1: 4.50%
	T2: 5.50%	T2: 3.50%	T2: 17.20%	T2: 5.40%	T2: 0.00%
	T3: 10.20%	T3: 1.60%	T3: 16.90%	T3: 8.30%	T3: 0.00%
Married other	T1: 0.40%	T1: 0.00%	T1: 0.00%	T1: 0.00%	T1: 0.00%
	T2: 0.60%	T2: 1.40%	T2: 0.00%	T2: 6.30%	T2: 3.70%
	T3: 1.30%	T3: 2.20%	T3: 0.00%	T3: 0.00%	T3: 0.00%
Lives alone	T1: 12.30%	T1: 13.70%	T1: 22.50%	T1: 18.10%	T1: 21.40%
	T2: 17.10%	T2: 14.50%	T2: 16.60%	T2: 13.60%	T2: 14.80%
	T3: 25.60%	T3: 24.10%	T3: 28.30%	T3: 16.70%	T3: 37.80%
Lives with parental figure	T1: 78.80%	T1: 80.00%	T1: 72.50%	T1: 76.50%	T1: 71.70%
	T2: 70.90%	T2: 73.00%	T2: 71.90%	T2: 70.30%	T2: 59.30%
	T3: 55.50%	T3: 61.90%	T3: 55.10%	T3: 62.50%	T3: 42.10%
Lives with father of the baby	T1: 25.60%	T1: 29.30%	T1: 25.00%	T1: 12%	T1: 23.00%
	T2: 31.20%	T2: 34.60%	T2: 21.80%	T2: 23.40%	T2: 48.10%
	T3: 27.40%	T3: 23.30%	T3: 11.20%	T3: 16.40%	T3: 31.30%
Maternal education					
In HS/GED ^b	T1: 40.10%	T1: 30.30%	T1: 57.50%	T1: 19.00%	T1: 33.70%
	T2: 24.20%	T2: 29.60%	T2: 35.00%	T2: 47.10%	T2: 14.80%
	T3: 10.90%	T3: 12.20%	T3: 17.50%	T3: 8.30%	T3: 12.70%
Finished HS/GED	T1: 40.10%	T1: 40.90%	T1: 17.50%	T1: 46.50%	T1: 46.70%
	T2: 58.80%	T2: 50.00%	T2: 45.50%	T2: 40.60%	T2: 51.90%
	T3: 76.10%	T3: 68.20%	T3: 56.60%	T3: 62.50%	T3: 79.80%
Dropped out	T1: 19.80%	T1: 28.80%	T1: 25.00%	T1: 34.50%	T1: 19.70%
	T2: 17.30%	T2: 20.40%	T2: 19.60%	T2: 12.30%	T2: 33.30%
	T3: 13.00%	T3: 19.70%	T3: 25.90%	T3: 29.20%	T3: 7.40%
Presence of report before T2	18.00%	26.10%	30.00%	12.50%	14.80%
EA FP sensitivity (T2)	4.74 (2.89)	4.59 (2.1)	5.61 (1.56)	4.53 (0.97)	4.93 (1.07)
EA TT sensitivity (T2)	4.56 (1.37)	4.37 (2.38)	5.12 (1.0)	4.55 (0.75)	4.37 (0.9)
EA FP hostility (T2)	4.26 (0.98)	4.23 (1.37)	4.59 (0.59)	4.16 (0.64)	4.44 (0.7)

EA TT hostility	3.94	3.94	4.25	4.08	3.88
(T2)	(1.07)	(1.44)	(0.67)	(0.97)	(0.57)
MM attuned	7.81	8.01	7.6	3.85	8.55
(T2)	(11.36)	(9.33)	(6.05)	(3.31)	(5.89)
QRI support	1.87	1.75	1.19	1.56	1.65
(T2)	(1.11)	(1.19)	(1.26)	(1.05)	(0.97)
QRI conflict	1.9	1.75	1.2	1.7	1.5
(T2) ^a	(1.25)	(0.74)	(1.11)	(0.66)	(0.76)
QRI depth (T2)	1.8	1.78	1.52	1.61	1.82
	(1.14)	(1.17)	(1.26)	(1.02)	(0.98)
Duration	9.36	9.65	10.09	8.73	8.76
	(4.26)	(6.3)	(3.32)	(3.31)	(4.95)
Number of	1.57	1.14	2.23	0.46	3.21
Groups	(3.47)	(1.79)	(2.57)	(0.62)	(4.57)
Number of visits	16.9	19.57	21.07	17.11	20.82
	(16.34)	(14.59)	(14.79)	(9.02)	(12.95)
Program	1.53	1.81	1.79	1.79	1.73
intensity	(1.09)	(1.02)	(1.06)	(0.72)	(0.88)
Number of child	0.27	0.35	0.45	0.67	0.37
maltreatment	(0.61)	(0.68)	(0.95)	(0.99)	(0.67)
report after T2					

Notes. M = Mean; SD = Standard deviation; T1 = Time 1; T2 = Time 2; T3 = Time 3; RI = Research Interview; EA = Emotional Availability; FP = Free play; TT = Teaching task; MM = Mind mindedness; QRI = Quality of Relationships Inventory.

^aThere was significant group difference.

^bThere was significant group difference at T1.

Table 4

Factor Loadings, Intercepts, Residual Variances, and Latent Mean, Variances and Covariances of the Modified Configural, Weak, and Strong Measurement Model (N = 508)

Parameter	Configural	Weak	Strong
	Stable-non depressed (N = 283)		
Factor loading:			
EA Sensitivity FP	1.27(0.08)***	1.23(0.06)***	1.23(0.06)***
EA Sensitivity TT	1.60(0.08)***	1.59(0.06)***	1.58(0.06)***
EA Nonhostility FP	0.44(0.08)***	0.45(0.05)***	0.45(0.05)***
EA Nonhostility TT	0.69(0.07)***	0.73(0.05)***	0.73(0.05)***
QRI Support	1.29(0.04)***	1.32(0.03)***	1.33(0.03)***
QRI Conflict	0.46(0.04)***	0.45(0.03)***	0.47(0.03)***
QRI Depth	1.25(0.04)***	1.22(0.02)***	1.21(0.02)***
Variance:			
Parenting	0.56(0.09)***	0.57(0.08)***	0.57(0.08)***
Partner Support	0.71(0.08)***	0.70(0.07)***	0.71(0.07)***
Covariance:			
Parenting - Partner Support	-0.04(0.06)	-0.04(0.06)	-0.03(0.06)
Theta (variance of residuals):			
EA Sensitivity FP	0.70(0.09)***	0.70(0.09)***	0.70(0.09)***
EA Sensitivity TT	0 ^a	0 ^a	0 ^a
EA Nonhostility FP	0.61(0.08)***	0.61(0.08)***	0.61(0.08)***
EA Nonhostility TT	0.54(0.07)***	0.54(0.07)***	0.54(0.07)***
QRI Support	0.05(0.05)	0.02(0.04)	0.01(0.04)
QRI Conflict	0.31(0.03)***	0.31(0.03)***	0.32(0.03)***
QRI Depth	0.14(0.05)**	0.17(0.04)***	0.18(0.04)***
Correlated Residual:			
EA Sensitivity FP ^b	0.25(0.06)***	0.25(0.06)***	0.25(0.06)***
EA Nonhostility TT ^b	0.26(0.05)***	0.26(0.05)***	0.26(0.05)***
Intercept:			
EA Sensitivity FP	-0.72(0.34)*	-0.55(0.26)*	-0.57(0.25)*
EA Sensitivity TT	-2.51(0.37)***	-2.46(0.28)***	-2.44(0.27)***
EA Nonhostility FP	2.30(0.35)***	2.27(0.24)***	2.27(0.24)***
EA Nonhostility TT	0.93(0.32)**	0.74(0.22)**	0.75(0.22)**
QRI Support	-0.54(0.07)***	-0.60(0.05)***	-0.59(0.05)***
QRI Conflict	1.04(0.08)***	1.05(0.07)***	0.96(0.06)***
QRI Depth	-0.50(0.07)***	-0.45(0.05)***	-0.37(0.05)***

Means:			
Parenting	4.41(0.08)***	4.41(0.08)***	4.41(0.07)***
Partner Support	1.85(0.06)***	1.85(0.06)***	1.84(0.06)***
Stable-low depressed (N = 134)			
Factor loading:			
EA Sensitivity FP	1.14(0.12)***	1.23(0.06)***	1.23(0.06)***
EA Sensitivity TT	1.66(0.18)***	1.59(0.06)***	1.58(0.06)***
EA Nonhostility FP	0.45(0.10)***	0.45(0.05)***	0.45(0.05)***
EA Nonhostility TT	0.75(0.10)***	0.73(0.05)***	0.73(0.05)***
QRI Support	1.35(0.04)***	1.32(0.03)***	1.33(0.03)***
QRI Conflict	0.41(0.07)***	0.45(0.03)***	0.47(0.03)***
QRI Depth	1.24(0.04)***	1.22(0.02)***	1.21(0.02)***
Variance:			
Parenting	0.65(0.15)***	0.66(0.14)***	0.66(0.14)***
Partner Support	0.67(0.10)***	0.70(0.10)***	0.70(0.10)***
Covariance:			
Parenting - Partner Support	0.13(0.09)	0.14(0.09)	0.14(0.09)
Theta (variance of residuals):			
EA Sensitivity FP	0.90(0.03)***	0.84(0.19)***	0.86(0.19)***
EA Sensitivity TT	0.17(0.27)	0.27(0.17)	0.28(0.17)
EA Nonhostility FP	0.60(0.11)***	0.61(0.11)***	0.62(0.11)***
EA Nonhostility TT	0.42(0.09)***	0.41(0.18)***	0.41(0.09)***
QRI Support	0 ^a	0 ^a	0 ^a
QRI Conflict	0.39(0.05)***	0.39(0.05)***	0.39(0.06)***
QRI Depth	0.20(0.03)***	0.20(0.03)***	0.20(0.03)***
Correlated Residual:			
EA Sensitivity FP ^b	0.36(0.10)***	0.36(0.10)***	0.37(0.10)***
EA Nonhostility TT ^b	0.25(0.07)***	0.26(0.07)***	0.26(0.07)***
Intercept:			
EA Sensitivity FP	-0.22(0.58)	-0.61(0.26)*	-0.57(0.25)*
EA Sensitivity TT	-2.67(0.78)**	-2.38(0.29)***	-2.44(0.27)***
EA Nonhostility FP	2.20(0.45)***	2.22(0.25)***	2.27(0.24)***
EA Nonhostility TT	0.68(0.45)	0.77(0.22)**	0.75(0.22)**
QRI Support	-0.62(0.08)***	-0.58(0.05)***	-0.59(0.05)***
QRI Conflict	1.00(0.12)***	0.93(0.08)***	0.96(0.06)***
QRI Depth	-0.38(0.08)***	-0.35(0.06)***	-0.37(0.05)***
Means:			
Parenting	4.40(0.12)***	4.40(0.12)***	4.44(0.11)***
Partner Support	1.68(0.08)***	1.68(0.09)***	1.68(0.08)***
Intermittently depressed (N = 40)			
Factor loading:			

EA Sensitivity FP	1.30(0.18)***	1.23(0.06)***	1.23(0.06)***
EA Sensitivity TT	1.58(0.20)***	1.59(0.06)***	1.58(0.06)***
EA Nonhostility FP	0.53(0.16)***	0.45(0.05)***	0.45(0.05)***
EA Nonhostility TT	0.59(0.18)***	0.73(0.05)***	0.73(0.05)***
QRI Support	1.28(0.06)***	1.32(0.03)***	1.33(0.03)***
QRI Conflict	0.59(0.10)***	0.45(0.03)***	0.47(0.03)***
QRI Depth	1.13(0.07)***	1.22(0.02)***	1.21(0.02)***
Variance:			
Parenting	0.44(0.16)***	0.43(0.12)***	0.44(0.12)***
Partner Support	1.68(0.13)***	0.65(0.14)***	0.64(0.14)***
Covariance:			
Parenting - Partner Support	0.23(0.11)*	0.22(0.11)*	0.13(0.04)**
Theta (variance of residuals):			
EA Sensitivity FP	0.85(0.22)***	0.85(0.22)***	0.85(0.22)***
EA Sensitivity TT	0 ^a	0 ^a	0 ^a
EA Nonhostility FP	0.59(0.14)***	0.59(0.15)***	0.60(0.15)***
EA Nonhostility TT	0.63(0.17)***	0.64(0.17)***	0.63(0.16)***
QRI Support	0 ^a	0 ^a	0 ^a
QRI Conflict	0.39(0.08)***	0.40(0.09)***	0.43(0.10)***
QRI Depth	0.25(0.05)***	0.25(0.05)***	0.26(0.06)***
Correlated Residual:			
EA Sensitivity FP ^b	0.38(0.14)**	0.39(0.14)**	0.39(0.14)**
EA Nonhostility TT ^b	0.27(0.11)*	0.26(0.11)*	0.26(0.11)*
Intercept:			
EA Sensitivity FP	-0.90(0.79)	-0.58(0.28)*	-0.57(0.25)*
EA Sensitivity TT	-2.43(0.90)**	-2.50(0.30)***	-2.44(0.27)***
EA Nonhostility FP	2.00(0.72)**	2.37(0.26)***	2.27(0.24)***
EA Nonhostility TT	1.33(0.80)	0.72(0.24)**	0.75(0.22)**
QRI Support	-0.48(0.12)***	-0.55(0.07)***	-0.59(0.05)***
QRI Conflict	0.58(0.18)**	0.81(0.10)***	0.96(0.06)***
QRI Depth	-0.11(0.14)	-0.27(0.07)***	-0.37(0.05)***
Means:			
Parenting	4.43(0.14)***	4.43(0.14)***	4.41(0.12)***
Partner Support	1.68(0.13)***	1.69(0.13)***	1.72(0.12)***
Stable-high depressed (N=40)			
Factor loading:			
EA Sensitivity FP	1.24(0.20)***	1.23(0.06)***	1.23(0.06)***
EA Sensitivity TT	1.58(0.17)***	1.59(0.06)***	1.58(0.06)***
EA Nonhostility FP	0.34(0.14)*	0.45(0.05)***	0.45(0.05)***
EA Nonhostility TT	0.85(0.12)***	0.73(0.05)***	0.73(0.05)***
QRI Support	1.41(0.12)***	1.32(0.03)***	1.33(0.03)***

QRI Conflict	0.38(0.18)*	0.45(0.03)***	0.47(0.03)***
QRI Depth	1.22(0.12)***	1.22(0.02)***	1.21(0.02)***
Variance:			
Parenting	0.66(0.27)*	0.65(0.23)**	0.66(0.23)**
Partner Support	0.56(0.18)**	0.63(0.17)***	0.63(0.17)***
Covariance:			
Parenting - Partner Support	-0.01(0.16)	-0.01(0.17)	-0.01(0.17)
Theta (variance of residuals):			
EA Sensitivity FP	1.11(0.38)**	1.11(0.38)**	1.15(0.40)**
EA Sensitivity TT	0 ^a	0 ^a	0 ^a
EA Nonhostility FP	0.30(0.10)**	0.30(0.11)**	0.32(0.11)**
EA Nonhostility TT	0.14(0.05)**	0.15(0.05)**	0.15(0.05)**
QRI Support	0 ^a	0 ^a	0 ^a
QRI Conflict	0.56(0.16)***	0.57(0.16)***	0.69(0.19)***
QRI Depth	0.37(0.10)***	0.37(0.10)***	0.44(0.12)***
Correlated Residual:			
EA Sensitivity FP ^b	0.28(0.16)	0.28(0.16)	0.30(0.17)
EA Nonhostility TT ^b	0.03(0.05)	0.02(0.05)	0.02(0.05)
Intercept:			
EA Sensitivity FP	-0.51(0.98)	-0.47(0.32)	-0.57(0.25)*
EA Sensitivity TT	-2.54(0.84)**	-2.60(0.32)***	-2.44(0.27)***
EA Nonhostility FP	2.91(0.66)***	2.38(0.27)***	2.27(0.24)***
EA Nonhostility TT	0.14(0.59)	0.69(0.25)**	0.75(0.22)**
QRI Support	-0.67(0.18)***	-0.55(0.09)***	-0.59(0.05)***
QRI Conflict	0.75(0.27)**	0.65(0.13)***	0.96(0.06)***
QRI Depth	-0.09(0.19)	-0.09(0.10)	-0.37(0.05)***
Means:			
Parenting	4.78(0.22)***	4.78(0.22)***	4.70(0.20)***
Partner Support	1.38(0.15)***	1.38(0.15)***	1.40(0.15)***

Notes. EA = Emotional Availability; FP = Free play; TT = Teaching task; QRI = Quality of Relationships Inventory.

^aTheta was fixed at 0 using effects coding identification method.

^bResiduals correlated to EA Nonhostility FP.

Table 5

Model Fit Statistics for the Test of Invariance in Parenting and Mother-Father Relationship Across Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	ΔCFI	Tenable ?
Null	1371.59	126	0	--	--	--	--	--	--	--	--	--
Measurement Model Estimates												
Configural initial	160.89	58	0				0.135	0.11;0.16	0.877	0.917	--	--
Configural	68.28	50	0.043	--	--	--	0.061	0.011;0.095	0.963	0.985	--	Yes
Weak	75.73	65	0.170	--	--	--	0.041	0.000;0.076	0.983	0.991	0.006	Yes
Strong	100.94	80	0.056	--	--	--	0.052	0.000;0.081	0.974	0.983	-0.008	Yes
Latent Model Estimates												
Variance/Covariance [^]	110.05	89	0.064	9.10	9	0.43	--	--	--	--	--	Yes
Latent Means [^]	110.49	86	0.038	9.54	6	0.15	--	--	--	--	--	Yes

[^]Compared to Strong Invariant Model.

Table 6

Model Fit Statistics of the Nested Model Comparisons Examining Mean Number of Child Maltreatment Reports Across Depression

Trajectory Groups (N = 508)

	LL	scaling correction factor	para meter s	TRd	Δ para meter s	<i>p</i>	AIC	BIC	Sample-size adjusted BIC	Tenable?
Final model	-5393.013	1.064	40	--	--	--	10866.03	11035.25	10908.28	--
Final model ^a	-5395.971	1.07	37	6.10	3	0.107	10865.94	11022.47	10905.03	Yes

Notes. LL = Log-likelihood; TRd = Satorra-Bentler scaled (mean-adjusted) chi-square; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

^aNumber of child maltreatment reports equated across groups.

Table 7

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Parenting, and Number of Child

Maltreatment Reports Across Depression Trajectory Groups (N = 508)

	LL	scaling correction factor	para met ers	TRd	Δ para mete rs	p	AIC	BIC	sample- size adjusted BIC	Tenable ?
M1:										
Base	-6543.977	27.66	98	--	--	--	13283.95	13698.54	13387.48	--
Mother age at birth ^a	-6544.067	0.97	95	0.00	3	0.999	13278.13	13680.03	13378.49	Yes
Mother age at birth ^b	-6544.724	0.93	94	0.28	1	0.591	13277.45	13675.11	13376.75	Yes
Child age at T2 ^a	-6545.524	0.93	91	1.94	3	0.584	13273.05	13658.02	13369.18	Yes
Child age at T2 ^b	-6548.052	0.94	90	11.93	1	0.000	13276.11	13656.85	13371.18	No
Income ^a	-6547.44	0.94	88	5.24	3	0.155	13270.88	13643.16	13362.84	Yes
Income ^b	-6548.146	0.95	87	2.82	1	0.092	13270.29	13638.34	13362.2	Yes
Report before T2 ^a	-6548.61	0.95	84	1.12	3	0.772	13265.22	13620.58	13353.95	Yes
Report before T2 ^b	-6555.055	0.95	83	14.40	1	0.000	13276.11	13627.24	13363.79	No
Child age at T2 ^b	-6549.432	0.95	83	3.75	1	0.052	13264.86	13615.99	13352.54	Yes
M2:										
Final hypothesized model	-6549.432	0.95	83	3.75	1	0.052	13264.86	13615.99	13352.54	Yes
Parenting ^a	-6556.893	0.96	80	20.90	3	0.000	13273.79	13612.23	13358.27	No
Parenting (Stable-high vs rest)	-6551.459	0.96	81	4.57	2	0.101	13265.1	13607.77	13350.66	Yes
Report before T2 ^a	-6556.494	0.959	80	9.38	1	0.002	13272.99	13611.43	13357.5	No
Parenting ^c	-6556.059	0.969	80	27.96	1	0.000	13272.12	13610.56	13356.63	No
Parenting ^d	-6553.794	0.94	80	2.46	1	0.116	13267.59	13606.03	13352.1	Yes
Final model: Parenting (Stable-high vs rest)	-6551.459	0.96	81	4.57	2	0.101	13265.1	13607.77	13350.66	Yes

Notes. LL = Log-likelihood; TRd = Satorra-Bentler scaled (mean-adjusted) chi-square; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

^cBeta coefficient for Stable-high depressed group was set at zero.

^dBeta coefficients for Stable-non depressed, Stable-low depressed, and Intermittently depressed were set at zero.

Table 8

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Parenting, and Number of Child Maltreatment Reports Across Depression Trajectory Groups (N = 508)

Parameter	M1 Covariates	M2 Final structural model
Stable-non depressed (N = 283)		
Variance:		
Parenting	0.58(74.69)	0.58(0.08)***
Maternal age at birth	1.69(0.17)***	1.69(0.11)***
Child age at T2	27.94(3.55)***	27.99(2.95)***
Income	326.28(577.5)	325.85(44.37)***
Presence of child maltreatment before T2	0.15(0.02)***	0.14(0.02)***
Means:		
Parenting	4.42(11.30)	4.41(0.07)***
Maternal age at birth	18.8(0.12)***	18.8(0.08)***
Child age at T2	11.93(3.84)**	11.93(0.36)***
Income	38.43(1.30)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Child maltreatment reports	-0.05(5.32)	0 ^a
Child age at T2 → Child maltreatment reports	-0.05(2.66)	0 ^a
Income → Child maltreatment reports	0.01(0.69)	0 ^a
Presence of child maltreatment before T2 → Child maltreatment reports after T2	0.94(16.98)	0.67(0.19)***
Parenting → Child maltreatment reports after T2	0.85(126.15)	0.43(0.23)
Stable-low depressed (N = 134)		
Variance:		
Parenting	0.66(21.43)	0.66(0.14)***
Maternal age at birth	1.52(0.15)***	1.52(0.15)***
Child age at T2	26.28(4.48)***	26.17(4.13)***
Income	307.07(141.5)*	307.14(57.52)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Parenting	4.46(5.82)	4.46(0.11)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.48(0.50)***	11.44(0.49)***
Income	39.12(1.60)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Child maltreatment reports after T2	-0.09(2.51)	0 ^a
Child age at T2 → Child maltreatment reports after T2	-0.01(0.41)	0 ^a
Income → Child maltreatment reports after T2	0.00(0.12)	0 ^a
Presence of child maltreatment before T2 → Child maltreatment reports after T2	0.70(2.82)	0.67(0 ^a)***
Parenting → Child maltreatment reports after T2	0.30(35.17)	0.43(0.23)
Intermittently depressed (N = 40)		
Variance:		
Parenting	0.41(15.64)	0.39(0.08)***
Maternal age at birth	1.88(0.23)***	1.88(0.23)***
Child age at T2	26.95(6.72)***	27.42(6.34)***
Income	326.27(611.67)	325.01(79.99)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Parenting	4.35(10.72)	4.34(0.12)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.28(1.31)***	12.17(0.79)***
Income	35.30(2.57)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Child maltreatment reports after T2	-0.12(0.20)	0 ^a
Child age at T2 → Child maltreatment reports after T2	-0.07(0.15)	0 ^a
Income → Child maltreatment reports after T2	-0.00(0.07)	0 ^a
Presence of child maltreatment before T2 → Child maltreatment reports after T2	0.76(1.46)	0.67(0.19)***
Parenting → Child maltreatment reports after T2	-0.01(2.50)	0.43(0.23)
Stable-high depressed (N=40)		
Variance:		
Parenting	0.72(7.71)	0.72(0.18)***
Maternal age at birth	1.08(0.20)***	1.08(0.20)***
Child age at T2	38.79(677.09)	37.36(10.59)***
Income	295.30(523.44)	294.74(53.90)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***

Means:

Parenting	4.60(11.87)	4.62(0.18)***
Maternal age at birth	18.13(0.16)***	18.13(0.16)***
Child age at T2	12.22(6.93)	12.32(1.12)***
Income	34.86(2.98)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***

Path model/Beta:

Maternal age at birth → Child maltreatment reports after T2	0.04(2.02)	0 ^a
Child age at T2 → Child maltreatment reports after T2	-0.12(0.85)	0 ^a
Income → Child maltreatment reports after T2	-0.04(0.14)	0 ^a
Presence of child maltreatment before T2 → Child maltreatment reports after T2	0.22(6.54)	0.67(0.19)***
Parenting → Child maltreatment reports after T2	-1.75(18.04)	-2.04(0.51)***

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 9

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Maternal Mentalization, and Parenting Across Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	679.862	198	0	--	--	--	--	--	--	--	--	--
M1:												
Base	159.891	121	0.010	--	--	--	0.05	0.026;0.07	0.868	0.919	--	--
Mother age at birth ^a	162.21	124	0.012	2.319	3	0.508	--	--	--	--	--	Yes
Mother age at birth ^b	163.071	125	0.012	0.861	1	0.353	--	--	--	--	--	Yes
Child age at T2 ^a	166.483	128	0.012	3.412	3	0.332	--	--	--	--	--	Yes
Child age at T2 ^b	178.977	129	0.002	12.494	1	0.000	--	--	--	--	--	No
Income ^a	172.055	131	0.009	5.572	3	0.134	--	--	--	--	--	Yes
Income ^b	175.442	132	0.006	3.387	1	0.065	--	--	--	--	--	Yes
Report before T2 ^a	179.353	135	0.006	3.911	3	0.271	--	--	--	--	--	Yes
Report before T2 ^b	183.751	136	0.004	4.398	1	0.035	--	--	--	--	--	No
M2:												
Final hypothesized model	179.353	135	0.006	3.911	3	0.271	0.051	0.028;0.07	0.865	0.908	--	Yes
Maternal mentalization ^a	182.655	138	0.007	3.302	3	0.347	--	--	--	--	--	Yes
Maternal mentalization ^b	183.128	139	0.007	0.473	1	0.491	--	--	--	--	--	Yes
Child age at T2 ^b	190.746	139	0.002	8.191	1	0.004	--	--	--	--	--	No
Report before T2 ^b	186.475	139	0.004	3.820	1	0.050	--	--	--	--	--	No
Final model: Maternal mentalization ^a	182.655	138	0.007	3.169	3	0.347	0.05	0.028;0.069	0.867	0.907	--	Yes

Notes. M1 = Model 1; M2 = Model 2; χ^2 = Chi-square; df = degrees of freedom; p = p-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 10

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Mother-Father Relationship, and Parenting Across Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	1707.58	286	0.000	--	--	--	--	--	--	--	--	--
M1:												
Base	281.864	201	0.000	--	--	--	0.056	0.04;0.071	0.919	0.943	--	--
Mother age at birth ^a	284.495	204	0.000	2.631	3	0.452	--	--	--	--	--	Yes
Mother age at birth ^b	285.848	205	0.000	1.353	1	0.244	--	--	--	--	--	Yes
Child age at T2 ^a	287.269	208	0.000	1.421	3	0.700	--	--	--	--	--	Yes
Child age at T2 ^b	299.329	209	0.000	12.06	1	0.000	--	--	--	--	--	No
Income ^a	292.163	211	0.000	4.894	3	0.179	--	--	--	--	--	Yes
Income ^b	295.519	212	0.000	3.356	1	0.066	--	--	--	--	--	Yes
Report before T2 ^a	302.607	215	0.000	7.088	3	0.069	--	--	--	--	--	Yes
Report before T2 ^b	308.996	216	0.000	6.389	1	0.011	--	--	--	--	--	No
M2:												
Final hypothesized model	302.607	215	0.000	7.088	3	0.069	0.057	0.041;0.071	0.918	0.938	--	Yes
Mother-father relationship ^a	308.076	219	0.000	5.469	4	0.242	--	--	--	--	--	Yes
Mother-father relationship ^b	310.771	220	0.000	2.695	1	0.101	--	--	--	--	--	Yes
Child age at T2 ^b	317.242	220	0.000	9.166	1	0.002	--	--	--	--	--	No
Report before T2 ^b	313.433	220	0.000	5.537	1	0.021	--	--	--	--	--	No
Final model: Mother-father relationship ^a	308.076	219	0.000	5.469	4	0.242	0.056	0.041;0.071	0.918	0.937	--	Yes

Notes. M1 = Model 1; M2 = Model 2; X^2 = Chi-square; df = degrees of freedom; p = p-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 11

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Program Intensity, and Parenting

Across Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	682.848	198	0.000	--	--	--	--	--	--	--	--	--
M1:												
Base	162.246	121	0.007	--	--	--	0.052	0.028;0.071	0.861	0.915	--	--
Mother age at birth ^a	165.182	124	0.007	2.936	3	0.401	--	--	--	--	--	Yes
Mother age at birth ^b	165.796	125	0.008	0.614	1	0.433	--	--	--	--	--	Yes
Child age at T2 ^a	167.659	128	0.010	1.863	3	0.601	--	--	--	--	--	Yes
Child age at T2 ^b	177.256	129	0.003	9.597	1	0.001	--	--	--	--	--	No
Income ^a	173.36	131	0.007	5.701	3	0.127	--	--	--	--	--	Yes
Income ^b	176.783	132	0.005	3.423	1	0.064	--	--	--	--	--	Yes
Report before T2 ^a	178.931	135	0.006	2.148	3	0.542	--	--	--	--	--	Yes
Report before T2 ^b	182.525	136	0.004	3.594	1	0.057	--	--	--	--	--	Yes
M2:												
Final hypothesized model	182.525	136	0.004	3.594	1	0.057	0.051	0.028;0.069	0.86	0.904	--	Yes
Program Intensity ^a	186.968	139	0.004	4.443	3	0.217	--	--	--	--	--	Yes
Program Intensity ^b	189.486	140	0.003	2.518	1	0.112	--	--	--	--	--	Yes
Child age at T2 ^b	196.209	140	0.001	9.241	1	0.002	--	--	--	--	--	No
Final Model: Program Intensity ^a	186.968	139	0.004	4.443	3	0.217	0.052	0.03;0.07	0.859	0.901	--	Yes

Notes. M1 = Model 1; M2 = Model 2; X^2 = Chi-square; df = degrees of freedom; p = p-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 12

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Number of Groups, and Parenting

Across Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	751.888	198	0	--	--	--	--	--	--	--	--	--
M1:												
Base	148.32	121	0.046	--	--	--	0.042	0.006;0.064	0.919	0.951	--	--
Mother age at birth ^a	150.479	124	0.053	2.159	3	0.540	--	--	--	--	--	Yes
Mother age at birth ^b	151.29	125	0.054	0.811	1	0.367	--	--	--	--	--	Yes
Child age at T2 ^a	153.508	128	0.061	2.218	3	0.528	--	--	--	--	--	Yes
Child age at T2 ^b	164.626	129	0.018	11.118	1	0.000	--	--	--	--	--	No
Income ^a	157.995	131	0.054	4.487	3	0.213	--	--	--	--	--	Yes
Income ^b	161.357	132	0.042	3.362	1	0.066	--	--	--	--	--	Yes
Report before T2 ^a	164.267	135	0.044	2.91	3	0.405	--	--	--	--	--	Yes
Report before T2 ^b	168.648	136	0.030	4.381	1	0.036	--	--	--	--	--	No
M2:												
Final hypothesized model	164.267	135	0.044	2.91	3	0.405	0.041	0.007;0.062	0.923	0.947	--	Yes
Number of groups ^a	170.787	138	0.030	6.52	3	0.088	--	--	--	--	--	Yes
Number of groups ^b	171.243	139	0.032	0.456	1	0.499	--	--	--	--	--	Yes
Child age at T2 ^b	178.782	139	0.012	7.995	1	0.004	--	--	--	--	--	No
Report before T2 ^b	174.691	139	0.021	3.904	1	0.048	--	--	--	--	--	No
Final model: Number of groups ^a	170.787	138	0.030	6.52	3	0.088	0.043	0.014;0.063	0.915	0.941	--	Yes

Notes. M1 = Model 1; M2 = Model 2; X^2 = Chi-square; df = degrees of freedom; p = p-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 13

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Number of Visits, and Parenting Across Depression Trajectory Groups (N = 508)

	X^2	<i>df</i>	<i>p</i>	ΔX^2	Δdf	<i>p</i>	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	948.132	198	0	--	--	--	--	--	--	--	--	--
M1:												
Base	157.756	121	0.013	--	--	--	0.049	0.023;0.069	0.92	0.951	--	--
Mother age at birth ^a	160.764	124	0.014	3.008	3	0.390	--	--	--	--	--	Yes
Mother age at birth ^b	161.414	125	0.015	0.65	1	0.420	--	--	--	--	--	Yes
Child age at T2 ^a	163.829	128	0.017	2.415	3	0.490	--	--	--	--	--	Yes
Child age at T2 ^b	174.604	129	0.004	10.775	1	0.001	--	--	--	--	--	No
Income ^a	169.78	131	0.012	5.951	3	0.114	--	--	--	--	--	Yes
Income ^b	173.129	132	0.009	3.349	1	0.067	--	--	--	--	--	Yes
Report before T2 ^a	175.716	135	0.010	2.587	3	0.459	--	--	--	--	--	Yes
Report before T2 ^b	179.057	136	0.007	3.341	1	0.067	--	--	--	--	--	Yes
M2:												
Final hypothesized model	179.057	136	0.007	3.341	1	0.067	0.049	0.025;0.068	0.916	0.942	--	Yes
Number of visits ^a	181.137	139	0.009	2.08	3	0.555	--	--	--	--	--	Yes
Number of visits ^b	185.075	140	0.006	3.938	1	0.047	--	--	--	--	--	Yes
Child age at T2 ^b	190.692	140	0.002	9.555	1	0.001	--	--	--	--	--	No
Final model: Number of visits ^a	181.137	139	0.009	2.08	3	0.555	0.049	0.025;0.068	0.92	0.944	--	Yes

Notes. M1 = Model 1; M2 = Model 2; X^2 = Chi-square; *df* = degrees of freedom; *p* = *p*-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 14

Model Fit Statistics of the Nested Model Comparisons Examining Relations Between Covariates, Duration, and Parenting Across

Depression Trajectory Groups (N = 508)

	X^2	df	p	ΔX^2	Δdf	p	RMSEA	RMSEA 90% CI	TLI	CFI	Δ CFI	Tenable ?
Null	672.409	198	0.000	--	--	--	--	--	--	--	--	--
M1:												
Base	154.302	121	0.0221	--	--	--	0.047	0.019;0.067	0.885	0.93	--	--
Mother age at birth ^a	156.88	124	0.0245	2.578	3	0.461	--	--	--	--	--	Yes
Mother age at birth ^b	157.706	125	0.0254	0.826	1	0.363	--	--	--	--	--	Yes
Child age at T2 ^a	159.488	128	0.0309	1.782	3	0.618	--	--	--	--	--	Yes
Child age at T2 ^b	169.845	129	0.0092	10.357	1	0.001	--	--	--	--	--	No
Income ^a	164.95	131	0.0239	5.462	3	0.140	--	--	--	--	--	Yes
Income ^b	168.24	132	0.0181	3.29	1	0.069	--	--	--	--	--	Yes
Report before T2 ^a	170.572	135	0.0207	2.332	3	0.506	--	--	--	--	--	Yes
Report before T2 ^b	174.225	136	0.015	3.653	1	0.055	--	--	--	--	--	Yes
M2:												
Final hypothesized model	174.225	136	0.015	3.653	1	0.055	0.047	0.022;0.066	0.883	0.919	--	Yes
Duration ^a	176.704	139	0.0169	2.479	3	0.479	--	--	--	--	--	Yes
Duration ^b	181.978	140	0.0098	5.274	1	0.021	--	--	--	--	--	No
Child age at T2 ^b	186.868	140	0.005	10.164	1	0.001	--	--	--	--	--	No
Final model: Duration ^a	176.704	139	0.0169	2.479	3	0.479	0.046	0.021;0.066	0.887	0.921	--	Yes

Notes. M1 = Model 1; M2 = Model 2; X^2 = Chi-square; df = degrees of freedom; p = p-value; RMSEA = Root mean Square Error of Approximation; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; variables were included simultaneously initially and tested for its significant one by one; each iteration of model is compared to the previous (less constrained) model.

^aBeta coefficient equated across groups.

^bBeta coefficient set at zero across groups.

Table 15

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Maternal Mentalization, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Maternal mentalization	40.83(5.46)***	40.83 (5.56)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.85(27.69)***
Presence of child maltreatment before T2	0.15(0.01)***	0.15(0.01)***
Means:		
Maternal mentalization	7.8(0.6)***	7.77(0.61)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.09)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.22(0.18)	0.28(0.14)*
Maternal mentalization → Parenting	-0.00(0.01)	0.01(0.01)
Stable-low depressed (N = 134)		
Variance:		
Maternal mentalization	34.17(6.22)***	34.27(6.26)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.13(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Maternal mentalization	8.34(0.75)***	8.37(0.75)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.44(0.49)***	11.44(0.49)***
Income	39.13(1.53)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.1(0.09)	0 ^a
Child age at T2 → Parenting	0.01(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.17(0.29)	0.28(0.14)*
Maternal mentalization → Parenting	0.03(0.02)	0.01(0.01)
Intermittently depressed (N = 40)		
Variance:		
Maternal mentalization	32.65(8.93)***	31.7(8.33)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.00)***	325.01(65.00)***
Presence of child maltreatment before T2	0.12(0.02)***	0.12(0.02)***
Means:		
Maternal mentalization	6.85(1.06)***	6.71(1.04)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	0.03(0.06)	0 ^a
Child age at T2 → Parenting	0.06(0.02)**	0.03(0.01)**
Income → Parenting	0.01(0.01)*	0 ^a
Presence of child maltreatment before T2 → Parenting	0.73(0.30)*	0.28(0.14)*
Maternal mentalization → Parenting	0.03(0.02)	0.01(0.01)
Stable-high depressed (N=40)		
Variance:		
Maternal mentalization	17.00(5.81)**	17.05(5.85)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.05)***	0.21(0.05)***
Means:		
Maternal mentalization	7.34(1.00)***	7.34(1.01)***
Maternal age at birth	18.13(0.16)***	18.13(0.16)***

Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.36(0.26)	0 ^a
Child age at T2 → Parenting	0.09(0.07)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-1.05(0.96)	0.28(0.14)*
Maternal mentalization → Parenting	-0.04(0.06)	0.01(0.01)

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 16

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Mother-Father Relationship, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Mother-father relationship	0.71(0.07)***	0.71(0.07)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.83(27.69)***
Presence of child maltreatment before T2	0.15(0.02)***	0.15(0.02)***
Means:		
Mother-father relationship	1.84(0.06)***	1.84(0.06)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.06)***	38.45(1.08)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.20(0.18)	0.33(0.14)*
Mother-father relationship → Parenting	-0.01(0.08)	0.10(0.06)
Stable-low depressed (N = 134)		
Variance:		
Mother-father relationship	0.70(0.10)***	0.70(0.10)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.12(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Mother-father relationship	1.68(0.08)***	1.68(0.08)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.44(0.49)***	11.44(0.49)***
Income	39.13(1.53)***	39.13(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.15(0.09)	0 ^a
Child age at T2 → Parenting	0.02(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.22(0.29)	0.33(0.14)*
Mother-father relationship → Parenting	0.19(0.12)	0.10(0.06)
Intermittently depressed (N = 40)		
Variance:		
Mother-father relationship	0.67(0.15)***	0.64(0.14)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.02)***	325.01(65.02)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Mother-father relationship	1.74(0.13)***	1.71(0.12)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	0.02(0.06)	0 ^a
Child age at T2 → Parenting	0.04(0.02)*	0.03(0.01)**
Income → Parenting	0.01(0.01)*	0 ^a
Presence of child maltreatment before T2 → Parenting	0.90(0.28)**	0.33(0.14)*
Mother-father relationship → Parenting	0.35(0.11)**	0.10(0.06)
Stable-high depressed (N=40)		
Variance:		
Mother-father relationship	0.63(0.17)***	0.63(0.17)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***
Means:		
Mother-father relationship	1.40(0.15)***	1.40(0.15)***
Maternal age at birth	18.13(0.16)***	18.13(0.16)***

Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.21(0.21)	0 ^a
Child age at T2 → Parenting	0.08(0.06)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-0.90(0.90)	0.33(0.14)*
Mother-father relationship → Parenting	0.15(0.27)	0.10(0.06)

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 17

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Program Intensity, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Program intensity	1.15(0.10)***	1.15(0.10)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.83(27.69)***
Presence of child maltreatment before T2	0.15(0.02)***	0.15(0.02)***
Means:		
Program intensity	0.82(0.07)***	0.82(0.07)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.06)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.19(0.18)	0 ^a
Program intensity → Parenting	-0.03(0.06)	-0.07(0.04)
Stable-low depressed (N = 134)		
Variance:		
Program intensity	1.35(0.17)***	1.35(0.17)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.12(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Program intensity	1.08(0.10)***	1.08(0.10)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.44(0.49)***	11.44(0.49)***
Income	39.13(1.53)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.13(0.09)	0 ^a
Child age at T2 → Parenting	0.01(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.15(0.30)	0 ^a
Program intensity → Parenting	-0.06(0.09)	-0.07(0.04)
Intermittently depressed (N = 40)		
Variance:		
Program intensity	1.41(0.29)***	1.42(0.29)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.02)***	325.01(65.00)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Program intensity	0.92(0.17)***	0.93(0.17)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	-0.01(0.06)	0 ^a
Child age at T2 → Parenting	0.04(0.02)*	0.03(0.01)**
Income → Parenting	0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.57(0.31)	0 ^a
Program intensity → Parenting	-0.17(0.09)	-0.07(0.04)
Stable-high depressed (N=40)		
Variance:		
Program intensity	1.15(0.27)***	1.15(0.27)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***
Means:		
Program intensity	0.72(0.18)***	0.72(0.18)***

Maternal age at birth	18.13(0.16)***	18.13(0.16)***
Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.24(0.21)	0 ^a
Child age at T2 → Parenting	0.07(0.06)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-0.75(0.88)	0 ^a
Program intensity → Parenting	0.08(0.13)	-0.07(0.04)

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 18

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Number of Groups, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Number of groups	6.59(0.58)***	6.59(0.58)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.83(27.69)***
Presence of child maltreatment before T2	0.15(0.02)***	0.15(0.02)***
Means:		
Number of groups	0.84(0.16)***	0.84(0.16)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.09)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.21(0.18)	0.28(0.14)*
Number of groups → Parenting	0.01(0.03)	-0.01(0.2)
Stable-low depressed (N = 134)		
Variance:		
Number of groups	1.79(0.23)***	1.79(0.23)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.12(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Number of groups	0.66(0.12)***	0.66(0.12)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.44(0.49)***	11.44(0.49)***
Income	39.13(1.53)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.12(0.09)***	0 ^a
Child age at T2 → Parenting	0.01(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.14(0.30)***	0.28(0.14)*
Number of groups → Parenting	0.05(0.07)	-0.01(0.2)
Intermittently depressed (N = 40)		
Variance:		
Number of groups	13.38(2.70)***	13.38(2.70)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.02)***	325.01(65.00)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Number of groups	1.08(0.52)*	1.08(0.52)*
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.06)	0 ^a
Child age at T2 → Parenting	0.05(0.02)*	0.03(0.01)**
Income → Parenting	0.01(0.01)*	0 ^a
Presence of child maltreatment before T2 → Parenting	0.64(0.30)*	0.28(0.14)*
Number of groups → Parenting	-0.05(0.03)	-0.01(0.2)
Stable-high depressed (N=40)		
Variance:		
Number of groups	3.58(0.84)***	3.58(0.84)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***
Means:		
Number of groups	0.75(0.32)*	0.75(0.32)*

Maternal age at birth	18.13(0.16)***	18.13(0.16)***
Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.22(0.20)	0 ^a
Child age at T2 → Parenting	0.06(0.06)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-0.54(0.90)	0.28(0.14)*
Number of groups → Parenting	0.10(0.10)	-0.01(0.2)

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 19

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Number of Visits, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Number of home visits	174.56(15.37)***	174.56(15.37)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.83(27.69)***
Presence of child maltreatment before T2	0.15(0.02)***	0.15(0.02)***
Means:		
Number of home visits	8.99(0.82)***	8.99(0.82)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.09)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.18(0.18)	0 ^a
Number of home visits → Parenting	-0.01(0.01)	-0.01(0.00)*
Stable-low depressed (N = 134)		
Variance:		
Number of home visits	201.16(25.45)***	201.16(25.45)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.12(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Number of home visits	11.86(1.27)***	11.86(1.27)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***

Child age at T2	11.44(0.49)***	11.44(0.49)***
Income	39.13(1.53)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.14(0.09)	0 ^a
Child age at T2 → Parenting	0.01(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.15(0.30)	0 ^a
Number of home visits → Parenting	-0.01(0.01)	-0.01(0.00)*
Intermittently depressed (N = 40)		
Variance:		
Number of home visits	223.39(45.13)***	223.39(45.13)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.02)***	325.01(65.00)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Number of home visits	10.71(2.14)***	10.71(2.10)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	-0.02(0.07)	0 ^a
Child age at T2 → Parenting	0.05(0.02)*	0.03(0.01)**
Income → Parenting	0.01(0.01)*	0 ^a
Presence of child maltreatment before T2 → Parenting	0.60(0.31)	0 ^a
Number of home visits → Parenting	-0.01(0.01)	-0.01(0.00)*
Stable-high depressed (N=40)		
Variance:		
Number of home visits	210.91(49.71)***	210.91(49.71)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***
Means:		
Number of home visits	8.44(2.42)***	8.44(2.42)***
Maternal age at birth	18.13(0.16)***	18.13(0.16)***

Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.25(0.21)	0 ^a
Child age at T2 → Parenting	0.07(0.06)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-0.75(0.88)	0 ^a
Number of home visits → Parenting	0.01(0.01)	-0.01(0.00)*

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 20

Parameter Estimates of the Betas, Means, and Variances in Models Examining the Relations Between Covariates, Duration, and Parenting Across Depression Trajectory Groups (N = 508)

Parameter	M1	M2
	Covariates	Final structural model
Stable-non depressed (N = 283)		
Variance:		
Duration	30.86(2.72)***	30.86(2.72)***
Maternal age at birth	1.69(0.14)***	1.69(0.14)***
Child age at T2	27.99(2.7)***	27.99(2.7)***
Income	325.83(27.69)***	325.83(27.69)***
Presence of child maltreatment before T2	0.15(0.02)***	0.15(0.02)***
Means:		
Duration	4.97(0.35)***	4.97(0.35)***
Maternal age at birth	18.8(0.08)***	18.8(0.08)***
Child age at T2	11.93(0.36)***	11.93(0.36)***
Income	38.45(1.09)***	38.45(1.09)***
Presence of child maltreatment before T2	0.18(0.02)***	0.18(0.02)***
Path model/Beta:		
Maternal age at birth → Parenting	0.01(0.05)	0 ^a
Child age at T2 → Parenting	0.03(0.01)*	0.03(0.01)**
Income → Parenting	0.00(0.00)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.19(0.18)	0 ^a
Duration → Parenting	-0.01(0.01)	-0.02(0.01)*
Stable-low depressed (N = 134)		
Variance:		
Duration	32.03(4.05)***	32.03(4.05)***
Maternal age at birth	1.52(0.19)***	1.52(0.19)***
Child age at T2	26.17(3.53)***	26.17(3.53)***
Income	307.12(37.95)***	307.14(37.95)***
Presence of child maltreatment before T2	0.19(0.02)***	0.19(0.02)***
Means:		
Duration	5.97(0.51)***	5.97(0.51)***
Maternal age at birth	18.87(0.11)***	18.87(0.11)***
Child age at T2	11.44(0.49)***	11.44(0.49)***

Income	39.13(1.53)***	39.12(1.53)***
Presence of child maltreatment before T2	0.26(0.04)***	0.26(0.04)***
Path model/Beta:		
Maternal age at birth → Parenting	0.13(0.09)	0 ^a
Child age at T2 → Parenting	0.01(0.02)	0.03(0.01)**
Income → Parenting	0.00(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	0.15(0.30)	0 ^a
Duration → Parenting	-0.01(0.02)	-0.02(0.01)*
Intermittently depressed (N = 40)		
Variance:		
Duration	36.70(7.41)***	36.70(7.41)***
Maternal age at birth	1.88(0.37)***	1.88(0.37)***
Child age at T2	27.42(5.85)***	27.42(5.85)***
Income	325.01(65.02)***	325.01(65.00)***
Presence of child maltreatment before T2	0.12(0.04)**	0.12(0.04)**
Means:		
Duration	4.83(0.87)***	4.83(0.87)***
Maternal age at birth	19.03(0.19)***	19.03(0.19)***
Child age at T2	12.17(0.79)***	12.17(0.79)***
Income	35.28(2.55)***	35.28(2.55)***
Presence of child maltreatment before T2	0.14(0.05)**	0.14(0.05)**
Path model/Beta:		
Maternal age at birth → Parenting	-0.00(0.06)	0 ^a
Child age at T2 → Parenting	0.04(0.02)*	0.03(0.01)**
Income → Parenting	0.01(0.01)*	0 ^a
Presence of child maltreatment before T2 → Parenting	0.56(0.31)	0 ^a
Duration → Parenting	-0.03(0.02)	-0.02(0.01)*
Stable-high depressed (N=40)		
Variance:		
Duration	32.62(7.69)***	32.62(7.69)***
Maternal age at birth	1.08(0.24)***	1.08(0.24)***
Child age at T2	37.36(9.65)***	37.36(9.65)***
Income	294.74(66.75)***	294.74(66.75)***
Presence of child maltreatment before T2	0.21(0.03)***	0.21(0.03)***
Means:		
Duration	4.39(0.95)***	4.39(0.95)***
Maternal age at birth	18.13(0.16)***	18.13(0.16)***

Child age at T2	12.32(1.12)***	12.32(1.12)***
Income	34.83(2.75)***	34.83(2.75)***
Presence of child maltreatment before T2	0.30(0.07)***	0.30(0.07)***
Path model/Beta:		
Maternal age at birth → Parenting	0.24(0.21)	0 ^a
Child age at T2 → Parenting	0.07(0.06)	0.03(0.01)**
Income → Parenting	-0.01(0.01)	0 ^a
Presence of child maltreatment before T2 → Parenting	-0.77(0.89)	0 ^a
Duration → Parenting	-0.01(0.03)	-0.02(0.01)*

Notes. T2 = Time 2; M1 = Model 1; M2 = Model 2.

^aBeta coefficients fixed at zero.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.