

ABSTRACT

Title of Dissertation: THE INFLUENCE OF FATHERS' AND MOTHERS' PSYCHOLOGICAL FUNCTIONING ON CHILDREN'S SOCIAL DEVELOPMENT: EXAMINING MEDIATING AND MODERATING PATHWAYS

Avery Hennigar, Doctor of Philosophy, 2021

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Human Development and Quantitative
Methodology

Young children's social skills are rooted in children's early relationships with their proximal caregivers, in particular the relationships with their mothers and fathers. One indicator of the parent-child relationship is the quality of their dyadic interactions. One factor that has been found to influence high quality parent-child interactions and children's subsequent social competence is a parent's psychological functioning. Guided by the bioecological model, this study examined the longitudinal effects through which mothers' and fathers' psychological functioning (i.e., their depressive symptoms, role overload, and optimism) influenced their children's social competence and problem behaviors through their dyadic synchrony during play in a sample of low-income families.

participating in a parenting intervention. It also tested the joint or combined effects of mothers' and fathers' psychological functioning on these pathways. The study is discussed with an eye towards future research, intervention, and policy efforts in including fathers as they remain an understudied and underutilized resource in promoting positive child development.

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FUNCTIONING ON CHILDREN'S SOCIAL DEVELOPMENT:
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by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park in partial fulfillment
Of the requirements for the degree of
Doctor of Philosophy
2021

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Acknowledgements

Thank you to my dissertation committee members for their guidance and invaluable feedback throughout this process: Drs. Brenda Jones Harden, Geetha Ramani, Greg Hancock, and Amy Lewin. I would like to thank my graduate mentor and advisor Dr. Natasha Cabrera, for continually fostering my intellectual curiosity and whose mentorship has greatly improved my scholarship.

Thank you to my lab mates Catherine Kuhns, Kelsey McKee, Tina Chen, Angelica Alonso, Rachel Ghosh, Alexa McDorman, and fellow graduate student Laura Jimenez Parra for their intellectual insights and moral support.

I would like to thank my family for their endless support and love throughout the years. And to Tyler for your constant encouragement, patience, and positivity. Thank you for always believing in me.

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Chapter 1: Introduction

Statement of the Problem

A wealth of literature indicates children's social competence plays a key role in children's overall school readiness and their academic achievement throughout school (Denham, 2006; Ladd et al., 2006; La Paro & Pianta, 2000; Raver, 2002; Rispoli et al., 2013). Social competence, broadly defined in the literature, is the ability to exhibit self-control, interact with others effectively, and resolve interpersonal conflicts to build and sustain positive relationships with other children and adults (Longoria et al., 2009; Wentzel, 1999). However, even by Kindergarten entry, research suggests children, particularly children from low-income families, vary greatly in their social skills (McWaye et al., 2012). Findings from a robust body of empirical and theoretical literature suggest that young children's social skills are rooted in children's early relationships with their proximal caregivers (Cooke et al., 2019; Rispoli et al., 2013; Schneider et al., 2001; Webster et al., 2013), in particular parent-child relationships. Thus, identifying the factors that might predict these positive parent-child relationships is an important step to better understand this variation in children's skills.

Theoretically, one of the factors that plays a key role in predicting high quality parent-child interactions and children's subsequent social skills is a parent's psychological functioning (Belsky, 1984; Cabrera et al., 2014; Taraban & Shaw, 2018). Psychological functioning is a construct that encompasses emotions, such as happiness or hope in addition to feelings of engagement, confidence, and affection (Huppert, 2009). Psychological functioning when operating effectively (e.g., experiencing self-efficacy, feeling that life is under control, having a sense of purpose) underlies one's ability to

perform daily activities and to engage in fulfilling relationships, which is also reflective of one's overall wellbeing (Huppert, 2009; Preedy & Watson, 2010). While variation in emotions, and experiencing painful emotions, is a typical and expected part of everyday life, when negative emotions reach chronic or toxic levels (i.e., clinical depression, toxic stress) healthy psychological functioning may be compromised (Huppert, 2009). Previous work has found that psychological functioning in parents specifically was linked to the quality of parent-child relationships and positive interactions with children early in life (Preedy & Watson, 2010). However, this literature suffers from several limitations. First, although evidence links psychological functioning to children's social development, the mechanisms through which this occurs is less clear. The studies that have examined the indirect effects of parents' psychological functioning on children's social skills (Baker & Iruka, 2013; Brody et al., 1994; Brody et al., 2002; Mistry et al., 2002) have focused on measures of parenting that capture how parents are responsive or warm towards their children, but do not capture how both parents and children are responsive to each other. Examining the pathway of influence at the level of the parent-child dyad, rather than at only the parent or child level separately, better represents the reciprocal nature inherent in parent-child relationships. Studies that use dyadic measures have found strong links to a host of developmental outcomes (see Leclere, 2014 for a review). One reason for this is that a measure of parental sensitivity, for example, does not tell us how the parent responds if the child is also unattuned or rejecting the parents' initial response. A dyadic measure enables us to assess whether the parent and the child are truly responding to each other's needs and bids for social interaction (Harris & Waugh, 2002).

Second, the literature on parental psychological functioning and children's social competence largely focuses on specific, select samples, namely single, African American mothers (Baker & Iruka, 2013; Brody & Flor, 1997; Brody et al., 2002). There is a need to conduct studies with diverse samples to provide insight into whether these processes operate similarly or differently across families with various demographic characteristics and family formations.

Third, this literature largely neglects the possible unique or independent effects of fathers' psychological functioning on children's development. Research that only includes mothers does not provide a full or accurate picture of young children's early experiences because it excludes children's interactions with one of their other primary caregivers (e.g., their fathers). Neglecting fathers in these statistical models can yield inaccurate estimates of the true magnitude of the observed effects. Previous studies have demonstrated that there are various unique or independent effects of fathers on their children's development (Cabrera et al., 2014; Cabrera et al., 2020), thus studies that do not include fathers are likely overestimating the effects of mothers or reporting that there is no relationship between an aspect of "parenting" (i.e., measured as mothering) and children's outcomes when there actually may be an effect if the model included fathers. Additionally, due to their exclusion from many child development and parenting studies, fathers may be an underutilized resource or caregiver to engage in interventions aimed at preventing maladaptive development in young children. However, it is still unclear whether the mechanisms that have been tested and found to work when examining patterns between mothers and their children also apply for fathers. Thus, research examining young children's social development that includes both mothers and fathers is

sorely needed. The proposed study builds on the emerging literature on fathers by testing both the unique and combined effects of fathering on children's social development.

Finally, overwhelmingly this literature focuses on children in middle childhood and preadolescence. Fewer studies have examined these relationships during infancy or early childhood when parent-child relationships are first forming and when they are the most proximal to children and their developing skills. A vast literature suggests having stable, supportive, and caring relationships in tandem with rich learning environments during the first years of life can yield lifelong benefits for learning, behavior, and physical and mental health (National Scientific Council of the Developing Child, 2009). Brain development research has shown that early experiences can set a trajectory for how various structures and pathways in the brain are developed and honed (National Scientific Council on the Developing Child, 2009; Shonkoff, 2009). Although the brain is adaptable enough where skills can always be learned, the circuitry established in the first years of a child's life become increasingly more difficult to alter over time (Shonkoff, 2009). Intervening early may be particularly important for those children who are most at risk for poor educational and achievement outcomes due to their environmental influences (Duncan et al., 2011). Therefore, additional work on this topic with samples of infants and toddlers is an important step toward advancing this literature and gaining a better understanding of how these processes operate when parent-child bonds are first forming.

The Current Study

This study uses data drawn from the Baby Books 2 Project (Cabrera & Reich, 2017) a longitudinal, multi-method study that includes maternal and paternal interviews, observational data on mother-child and father-child interactions during a play task 9

months later, and parental reports of children's behavior when they were 21 months old. The sample includes 210 children and their mothers and fathers. During the interview when infants were 9 months old, mothers and fathers were asked to provide demographic information (e.g., education, employment) and to report on indicators of their psychological functioning (e.g., depressive symptoms, optimism, feelings of being overwhelmed). During the observation when toddlers were 18 months old, mothers and fathers were each videotaped engaging in a play task with two bags of developmentally appropriate toys. These play sessions were coded for dyadic synchrony between each of the parent-child dyads on a five-point scale. Three months following, both mothers and fathers reported on their children's social competence and problem behaviors.

Research Questions and Hypotheses

Using this diverse sample of children and their mothers and fathers, I ask the following research questions:

Research Question 1:

What are the associations between mothers' and fathers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months?

Hypothesis: Mothers and fathers with higher levels of psychological functioning will have toddlers with increased social competence and decreased problem behavior scores compared to mothers and fathers with lower levels of psychological functioning.

Research Question 2:

Is the association between mothers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months mediated by mother-

child dyadic synchrony at 18 months? Is the association between fathers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months mediated by father-child dyadic synchrony at 18 months?

Hypothesis 2.1: Mothers who report higher levels of psychological functioning will have toddlers with higher parent-reported social competence and lower problem behavior scores because they exhibit higher dyadic synchrony compared to mothers who report lower levels.

Hypothesis 2.2: Fathers who report higher levels of psychological functioning will have toddlers with higher parent-reported social competence and lower problem behavior scores because they exhibit higher dyadic synchrony compared to fathers who report lower levels.

Research Question 3:

Is there a joint effect of both parent's psychological functioning at 9 months on children's social competence and problem behaviors at 21 months?

Hypothesis 3.1: The positive association between a parent's (i.e., mother or father) high psychological functioning and toddlers' social competence will be stronger when the other parent also has high psychological functioning (strengthening hypothesis).

Hypothesis 3.2: The negative association between one parent's (i.e., mother or father) high psychological functioning and children's problem behaviors will be stronger when the other parent also has high levels of psychological functioning (strengthening hypothesis).

Hypothesis 3.3: The negative association between a parent's (i.e., mother or father) low psychological functioning and toddlers' social competence will be mitigated

by high levels of psychological functioning from the other parent (compensatory hypothesis).

Hypothesis 3.4: The positive association between a parent (i.e., mother or father) with low psychological functioning and toddlers' behavior problems will be mitigated when the other parent has high psychological functioning (compensatory hypothesis).

Contribution to the Field

This study adds to the existing literature on parental psychological functioning and child social development in several ways. Methodologically, this study advances the field because it includes observational measures of the quality of the parent-child relationship at the dyadic level. It also accounts for both mothers' and fathers' contributions to children's social competence and includes both parents in the same statistical model to simultaneously test these pathways. This study also tests for the potential joint effects of mothers' and fathers' behaviors. This type of finding contributes to a growing evidence base on the effects of fathers on children's outcomes that emphasizes the importance of including both parents in studies of child development.

This study also makes important theoretical and conceptual contributions. This study focuses on early childhood, a time that is critical for the development of social competencies that set the stage for future growth and academic success. It is particularly important to understand the underlying factors that predict the quality of parent-child relationships and interactions in order to develop interventions that target those families that may need services the most. This study also seeks to replicate previous findings using a diverse sample of two-parent families. This sample is diverse in its racial/ethnic makeup, parents' nativity status, and parents' level of education, and it includes families

from both the east and west coast of the United States. Finally, while this sample ranges in income with many families experiencing economic hardship, which poses a risk for children's optimal development, this study is framed from a strengths-based approach. Many children from low-income families demonstrate various competencies and developmental skills, despite growing up in economic disadvantage. Yet, the majority of research that includes low-income samples focus on children's deficits or compare low-income children's outcomes to samples of more affluent families, focusing on the gaps between these groups (Coll et al., 1996; Hamby, in press; Parke, 2000). Identifying those family processes that are working well contributes to an emerging literature that emphasizes assets that programs and policymakers can capitalize on, rather than emphasizing issues.

Chapter 2: Review of the Literature

Posited by Bronfenbrenner and Morris (1998, 2006), children's interactions in their early home environment with their proximal caregivers (i.e., their microsystem) are critical experiences that shape key socioemotional skills that have lasting effects on various aspects of a child's development and growth (see Bornstein, 2015 for a review; National Scientific Council on the Developing Child, 2007; Sroufe, 2005). These early parent-child interactions in the home are determined, in part, by parents' psychological resources (Belsky, 1984; Taraban & Shaw, 2018); for example, one's optimism or sense of control. Evidence from studies with low-income families, has specifically focused on the relationships between parents' psychological functioning and children's development (Brody et al., 1994; Brody et al., 2002). Psychological functioning, in part, reflects one's ability to sustain positive relationships, which inevitably shape one's ability to parent effectively and create nurturing, positive bonds with their child (Brody et al., 1994; Brody et al., 2002). However, the vast majority of studies measure the quality of parent-child relationships and interactions by focusing on parent-driven effects (Paschall & Mastergeorge, 2016; see O'Connor, 2002 for a review). Yet, child development theories indicate that children also play a large role in how they are parented (Bronfenbrenner & Morris, 2006; Sameroff, 1975; Sameroff, 2009). Moreover, empirical evidence demonstrates that the extent to which parents and children engage in reciprocal, co-regulated parent-child interactions is positively related to the development of social competencies (Feldman, Bamberger, & Kanat-Maymon, 2013; Feldman & Masaha, 2010). Neglecting to include the contributing influence of the child ignores a key contributor to the parent-*child* relationship, likely overestimating the effects of parents.

The following review provides an examination of the literature that links parents' psychological functioning to children's socioemotional development as well as the mechanisms that explain why parents' psychological functioning is associated with children's social development. I organize this review in the following way: (1) provide an overview of the theoretical framework guiding this study; (2) describe the construct of psychological functioning and how it has been measured in previous literature; (3) examine and review the empirical evidence of psychological functioning on children's social development; (4) explain the key mechanisms that support the current study; and (5) identify future directions and conclusions.

Theoretical Background

Bioecological model

Bronfenbrenner's bioecological model (Bronfenbrenner & Morris, 2006) is a foundational theoretical framework in the field of child development suggesting that children are embedded within an intersecting environmental system that shapes their developmental trajectory as a result of these interactive encounters between themselves and their environment. According to this theory, children are socialized primarily through their microsystem, or their immediate and most proximate environments (i.e., the early home environment), and those individuals present within this environment (i.e., parents and caregivers). This model also suggests that children are influenced by the interrelation between microsystems, known as the mesosystem. The positive interactions between children's proximal environments (e.g., home and childcare) are important for supporting children's optimal growth and development. Moreover, the bioecological model indicates that there are distal influences that influence children's development. The

exosystem (e.g., parents' work environment) and macrosystems (e.g., culture, norms, policies) have an indirect effect on children. The cascading influences of policies, cultural values, and norms reach the child through the interaction of other subsystems. In the current study, the microsystem is pertinent as I examine the associations between mothers' and fathers' psychological functioning on the quality of their dyadic interactions with their toddlers in their homes.

The bioecological model of development also hypothesizes that there are reciprocal influences between children and their most proximal environments and individuals, of which the most important to young children are their parents and their home environment (Bronfenbrenner & Morris, 2006). For example, when children have repeated reciprocal interactions with their parents at home, they engage in progressively complex patterns of interaction. These interactions provide unique opportunities that foster increased social competence as children learn to cope with differential power relations and social conventions that can be applied in a variety of ecological settings. These foundational interactions are also shaped by more distal, contextual factors, such as parents' economic resources (Conger & Conger, 2002). These contextual factors shape parenting beliefs and practices, such as the use of specific control strategies, discipline practices, or cultural beliefs, which in turn influence how children learn about the world and develop socially normative behaviors (Grusec et al., 2000; Klahr & Burt, 2014; Malin et al., 2014).

This model also suggests that children uniquely contribute to their own development by eliciting responses from their parents. For instance, children's innate characteristics, such as temperament or gender, may produce parental responses that

predict different developmental trajectories (McBride et al., 2002; Mulsow et al., 2002). Also supported by additional developmental theories, such as the transactional model of development, these bidirectional influences create complex patterns of development and enable children to master increasingly difficult learning processes in the presence of positive reciprocal interactions (Sameroff, 1975; Sameroff, 2010). This study is framed within the ecological perspective that mothers, fathers, and children influence the development of children's social skills through their direct and reciprocal interactions in the home.

The Importance of Parents' Psychological Functioning

Belsky (1984) and Bronfenbrenner and Morris (2006) both theorized that parents' personality and personal psychological resources are important for children's development as these resources directly affect parenting. However, much of the literature that focuses on the effects of parents' psychological resources and parenting focus on atypical or psychopathological samples (Bornstein et al., 2011). Therefore, we know less about how parents' typical functioning and wellbeing relates to their relationship and interactions with their child, even though the vast majority of the population does not experience psychopathological levels of psychological disfunction.

Despite an extensive literature examining the influences of maternal psychological wellbeing on children, in their body of work, Brody and colleagues operationalized psychological functioning as a constellation of psychological characteristics, with the underlying assumption that a parents' overall wellbeing includes sources of stress, but also sources of positivity. Operationalized in this way, psychological functioning is a better measure to capture more typical functioning in non-

clinical samples. An emerging literature examines parents' (mainly mothers) typical psychological functioning as it relates to children's social adjustment, which is the focus of this review.

Measuring Psychological Functioning

The literature examining psychological functioning on children's outcomes has used various terms to represent the same or similar constructs. Some studies use the term "psychological functioning" while others use "psychological distress" and there is not a clear delineation between the use of the two terms. In fact, studies will use nearly identical indicators, but name the construct differently. Psychological functioning typically measures one's mental health and wellbeing, emotional state, and perceptions of oneself by constructing a variable consisting of parents' reports on their depressive symptoms, self-esteem or sense of self, as well as their feelings of optimism or hope (Brody et al., 2002). Studies that focus on psychological distress include similar measures of depressive symptoms, efficacy, or economic worry; however, others utilize existing measures of psychological distress asking parents to report on a symptom inventory or checklist of feelings and behaviors (e.g., Symptom checklist, Eysenck personality Inventory) rather than creating a composite or latent variable. Some studies even use the term functioning and distress interchangeably throughout the study (Murry et al. 2001; Murry et al., 2002).

Due to the lack of guidance and clarity from the literature, I include a review of both the functioning and distress literatures. Across both of these literatures, similar measures are used as indicators of psychological wellbeing; however, the difference lies in the framing of these two constructs. The distress literature tends to shed a negative

light on the ways in which economic hardship and poverty influence parents' psychological state in a harmful way; however, regularly framing this research in a negative light neglects to acknowledge the many strengths these families possess despite challenging circumstances. While these two constructs measure similar concepts, the psychological functioning literature frequently frames research inquiries from a more positive development perspective. Studies focusing on psychological functioning often include measures of parental optimism. Feelings of hope and having faith in the future may be key protective factors among low-income families facing economic hardship. Therefore, for the purpose of this study, I utilize the term psychological functioning to address the resilience of low-income families.

Parent's Psychological Functioning and Children's Social Development

There is a wealth of literature linking maternal psychological distress and children's developmental outcomes (Kingston et al., 2012; Yoo et al., 2014); however, most of this literature focuses on singular dimensions of distress, such as depressive symptoms or stress, and fewer studies examine these associations when measuring psychological functioning as an overall composite or factor. Gene Brody and colleagues expanded this empirical work on psychological functioning and children's social development utilizing a sample of low-income, African American families with youth in the rural south throughout the late 90s and 2000s. For example, Brody and Flor (1997) examined these relations in a sample of 156 African American single mothers and their 6- to 9-year-old children. In this study, they examined the direct and indirect pathways between maternal financial resources, maternal depressive symptoms, maternal self-esteem, and family processes (i.e., family routines and mother-child harmony which was

measured via observations of a mother-child interaction in three contexts). These pathways were also linked to youth's academic outcomes and social behaviors (i.e., externalizing and internalizing problems) mediated through child self-regulation. They found that a lack of financial resources was associated with increased depressive symptoms and lower self-esteem. They also found that self-esteem, but not depressive symptoms, was associated with family routines and mother-child harmony, which was also indirectly associated with youth's outcomes through child self-regulation. This study is unique as it is one of the few to utilize measures of parent-child relationship quality, coded at the dyadic level through observations; however, these data were cross-sectional in nature limiting the ability to draw any conclusions regarding causality.

Using a similar sample of 150 African American single mother families from the rural south, Brody, Murry, Kim, and Brown (2002) examined the longitudinal relations between maternal education and per capita income, maternal psychological functioning, competence promoting parenting practices, and various youth outcomes, including self-regulation, cognitive and social competencies (i.e., teacher rating on the cognitive subscale and social subscale of the Perceived Competence Scale for Children), and psychological adjustment (i.e., teacher reports of aggressive behavior, delinquent behavior, and inattentive/anxious behavior on the Teacher Report Form). Guided by the bioecological model, Brody, Murry, Kim and Brown (2002) defined maternal education, family financial resources, and maternal psychological functioning as distal variables that were indirectly associated with children's competence and adjustment via parenting processes. As parenting processes were the most proximal to the child, they were modeled to have a direct effect on children's outcomes. Similar to previous work, Brody

and colleagues operationalized psychological functioning to include maternal self-esteem, optimism, and depressive symptoms. Brody et al. (2002), defined competence-promoting parenting practices as involved, supportive, and highly vigilant parenting, as well as the frequency of bidirectional mother-child discussions. Ultimately, they found longitudinal support for their model. Specifically, maternal education and per capita income were associated with psychological functioning at time 1 (when youth were 10 years old), which had a direct effect on mothers' competence promoting parenting one year later, which in turn had an indirect effect on youth's cognitive competence, social competence and psychological adjustment when they were 12-years-old, also mediated through youth's self-regulation. While this study improved upon some of the limitations from the previous studies by testing these relationships longitudinally and by utilizing psychological functioning as its own latent variable in the model, this study is still limited by its lack of generalizability to more diverse samples.

In an ethnically diverse, low-income sample of 419 children (*Mage* = 8.26 years), Mistry and colleagues (2002) found results in line with previous studies. Specifically, they found that economic pressure indirectly affected parenting behavior through its influence on parental psychological wellbeing (i.e., financial worry, efficacy, and depressive symptoms). While some fathers were included in this study, 95% of the sample was female and 83% of the sample were single-parent families. They found that mothers who reported more distress also reported feeling less efficacious and capable when disciplining their children and were observed to be less warm during their interactions with their children. These parenting behaviors were also significant predictors of children's behavior problems (i.e., externalizing problems, hyperactivity,

and frequency of disciplinary problems as reported by the child's teacher). They did not find any differences across boys and girls, nor across African American and Hispanic families, suggesting that this relationship may operate similarly regardless of child gender and ethnicity, which had yet to be examined in previous studies.

One study with greater external validity utilized a nationally representative sample of children from the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99, although Baker and Iruka (2013) also focused on a subsample of African American mothers and their children. They examined maternal psychological functioning, which they operationalized as depressive symptoms (i.e., measured via the CES-D) and parenting stress (i.e., measured via the Parenting Stress Index), as it related to children's emerging math and reading achievement in kindergarten, mediated through maternal warmth, cultural socialization, and home learning stimulation. Each of these three parenting behaviors were measured via the Home Observation for Measurement of the Environment scale (Bradley & Caldwell, 1984). Using path analysis, they found that maternal depression and parenting stress had a direct effect on maternal warmth, home learning stimulation, and cultural socialization. Moreover, they found a significant indirect effect between parenting stress and math achievement, mediated through home learning stimulation. They also found that maternal warmth mediated the relationship between maternal depression and reading achievement. This study was able to replicate similar findings to Brody and colleagues (1997; 2002) in finding a relationship between psychological functioning and child outcomes mediated through parenting, and demonstrated that this result can be generalized to African American families nationally, suggesting that this result is not specific to low-income, rural mothers and their children.

Including the effects of fathers' psychological functioning

Murry and colleagues (2001) examined the role of psychological functioning (i.e., self-reported depression and anxiety) as predicted by stress pile up (i.e., life events, financial strain, and job stress) on the quality and nurturance in the mother-child relationship, mediated by mothers' perceived relationship stability and relationship satisfaction with their romantic partner. In this study, the sample consisted of 386 African American families where the mother was either married or cohabitating and living in rural poverty, and had a child between 10- and 11-years-old. They found both direct and indirect effects of maternal psychological functioning on mother-child relationship quality, mediated through partner relationship quality. An additional study, consisting of 234 African American single mothers who had a child between 7- and 15-years-old, further expanded this building literature by examining these relations in a geographically diverse sample, with approximately half of the sample living in metropolitan counties and the other half in rural counties, and by including the effects of the child's father (Dorsey et al., 2007). This study examined the effects of coparenting conflict (i.e., measured via mother self-report on the Parenting Convergence Scale) on maternal psychological distress (i.e., three subscales of the Brief Symptom Scale including depression, anxiety, and interpersonal sensitivity) and positive parenting (i.e., measured via maternal report of mother-child relationship quality, maternal monitoring of child activities, and disciplinary consistency). They found that conflict with a co-caregiver was significantly related to parenting practices both directly and indirectly through maternal psychological distress. Taken together, these studies suggest that mothers' psychological functioning influences both mothers' perceptions of the quality of the coparenting relationship as well as the

quality of the romantic relationship with their partner, and that this association has important implications for children. However, a major limitation of these studies is that neither included fathers themselves, but instead relied on maternal report and mothers' perceptions of their relationship.

There are a handful of studies that focus on the psychological functioning or distress of fathers that include fathers themselves in their samples. In one of the few studies to include both mothers and fathers, Brody and colleagues (1994) examined whether maternal and paternal psychological functioning (e.g., depressive symptoms measured by the Center for Epidemiologic Studies Depression Scale (CES-D), optimism measured by the optimism subscale of the CES-D, and self-esteem measured by Rosenberg's Self-Esteem scale) was predicted by parents' financial resources, as it related to family processes (i.e., marital interaction quality, fathers' and mothers' co-caregiving support received from each other, and co-caregiver conflict) and youth outcomes. Youth's outcomes consisted of their reading performance, mathematics performance, externalizing and internalizing problems, mediated through youth's self-regulation. Also using structural equation modeling to test these relationships, they ran separate models for mothers and fathers. Overall, they found in this sample of 90 two-parent, African American families, that a lack of family financial resources was associated with poorer psychological functioning (i.e., more depressive symptoms, lower optimism) for both mothers and fathers, which in turn was linked with poorer coparenting support and increased coparenting conflict. Coparenting support and conflict were then associated with poorer youth academic and socioemotional competencies mediated through child self-regulation, for the model that included mothers. However, in the model

with fathers, they found a negative association between fathers' caregiving support from mothers and youth self-regulation. While they did not test for any spillover effects between mothers and fathers, they hypothesized that this effect may be due to mothers stepping in and providing more caregiving support to fathers when youth have already demonstrated lower self-regulation skills. Although this study included both mothers and fathers, which is one of the few studies in this literature to do so, these data were cross-sectional and they did not test these relationships over time making it difficult to tease apart the directionality of these effects. Further, they tested models separately for mothers and fathers, limiting the ability to examine spillover or joint effects between parents.

Over 20 years later, Yoo et al. (2015) examined the role of fathers' psychological distress (i.e., neuroticism, marital discord, and family conflict) on children's representations of fathers' disciplinary qualities and children's perception of family harmony and conflict, guided by Belsky's (1984) model of parenting and attachment theory. They also tested whether fathers' perceptions of infant's temperament mediated this relationship. Using a sample of 319 fathers who had same-sex twins from the MacArthur Longitudinal Twin Study when children were 14 months and 5-years-old, they ran structural equation models and found that fathers' distress was associated with children's negative representations of fathers and family conflict, but children's positive representations did not decrease when fathers displayed increased distress (Yoo et al., 2015). Children preserved positive family features in their narratives about their families, even in the face of fathers' distress. While this study advanced the literature by including fathers, it did not include mothers in the statistical models, making it difficult to

determine if there are similarities or differences in how these processes operate across both parents.

As the literature that includes low-income fathers' psychological functioning is still emerging, I also draw on studies that utilize middle class parents to further demonstrate the ways the psychological functioning of both parents influences children's social development. Papp et al. (2005) examined the role of psychological distress on the parent-child relationship quality and child adjustment cross-sectionally. Using a sample of 277 white, middle class, two-parent families and their 8- to -16-year-old children they found that the relationship between parental psychological distress (i.e., parental self-report on the Symptom Checklist-90-Revised) and child behavior problems was mediated by parental acceptance (i.e., parental self-report on the Parental Behavior Inventory) and psychological autonomy (i.e., child report of parents' strictness and supervision via the Index of Parenting Style). They further tested for transactional pathways whereby child functioning was modeled to have a direct influence on, as well as to be affected by, parental acceptance and psychological autonomy. These pathways were found to be statistically significant, supporting the idea that these processes are bidirectional. Moreover, additional studies conducted by Papp and colleagues (2004a, 2004b, 2007) also utilized white, middle class convenience samples of married couples. These studies focused on spouses' psychological distress (also measured via that Symptom CheckList-90-Revised), marital conflict and marital distress, and child adjustment (i.e., parental ratings on the Child Behavior Check List). Together, findings from these studies indicate that the quality of mothers' and fathers' romantic relationship mediates the relationship between parents' psychological distress and children's later adjustment. In one of these

studies, they also included interaction tests that revealed unique pathways for mothers and fathers (Papp et al., 2004). Specifically, for mothers, the combined influence of poor marital functioning and increased psychological distress moderated the negative effects on children's adjustment problems. This study further highlights the need to consider multiple family influences as these pathways of influence may be unique for mothers and fathers.

Summary of the evidence

The empirical evidence supports that psychological functioning predicts children's academic outcomes and social development and that this association operates through a variety of family and relationship processes. The majority of these studies are longitudinal by design and utilize structural equation modeling to test their hypotheses, enabling researchers to test effects over time using constructs that account for measurement error. Additionally, these studies largely report moderate effect sizes. However, this research has been conducted with very specific samples. For the most part, these studies are almost exclusively conducted with single African American mothers or with white, middle class two-parent families. While the reproducibility of these findings is apparent across this body of work, the need to expand this body of work with more diverse samples is needed. In addition, with a few exceptions, this literature has mainly been conducted with youth (i.e., ages 6- to 12-years). Yet, early childhood is an essential time in a child's life for forming these key social competency skills, therefore additional research should examine these processes and outcomes as children are forming these key bonds and abilities. This literature is also limited as parenting variables in these studies are measured in inconsistent ways, and for the most part these measures are limited to

maternal self-reports. Additional research that includes samples that are racially and ethnically diverse, measure these constructs with both mothers and fathers and utilize more objective measures of parenting during early childhood is critical to advance this literature.

Exploring the Mechanisms

While the body of work examining psychological functioning and child developmental outcomes tests both direct effects as well as mediating mechanisms, much of this literature utilizes unidirectional measures of parenting, such as parental sensitivity/responsiveness, maternal warmth, or parents' disciplinary actions, to predict children's outcomes and does not focus on the quality of the parent-child relationship—the foundational relationship for children when they are developing social skills critical for future relationships and adjustment (Paschall & Matergeorge, 2016). While these measures of parenting have been found to be significant predictors of children's behavior, I seek to test an alternative pathway that better captures the reciprocal nature of parent-child relationships through which parents' psychological functioning might operate.

Dyadic synchrony and children's social development

Dyadic synchrony captures a style of dyadic interaction that is jointly responsive and regulated, emotionally warm, and where both members of the dyad are in tune with each other's behaviors and emotions (Delaherache et al., 2012; Funamoto & Rinaldi, 2015; Leclere et al., 2014). Rather than focusing solely on the individual behavior of a parent or child, measuring the dyadic quality or style of an interaction accounts for the bidirectional, dynamic, “give-and-take” nature of the relationship between parents and their children (Harrist & Waugh, 2002; Leclère et al., 2014). There have been a variety of

terms used throughout the literature that represent similar concepts, but there has been no clear or common definition consistently used for synchrony-related constructs. Yet, many of these constructs have overlapping conceptions, indicating that they are measuring similar behaviors, including dyadic mutuality, reciprocal responsiveness, contingent responsiveness, or mutually responsive orientation. For the purpose of this study, the term dyadic synchrony will be used to represent the extent to which a dyad is mutually engaged, shares positive affect and enjoyment, and is in sync with one another's behaviors and style of play. Most studies assess dyadic synchrony as a global construct that includes shared responsiveness, joint attention, turn taking or cooperation, and shared affect (Funamoto & Rinaldi, 2015; Leclère et al., 2014).

Dyadic synchrony is an important indicator of the quality of parent-child interactions (Deater-Deckard & Petrill, 2004; Harrist & Waugh, 2002) and has been linked to children's positive social development in numerous studies (Funamoto & Rinaldi, 2015; Gartstein et al., 2008; Gursek & Davidov, 2010; Lindsey et al., 2010; Nicely, Tamis-LeMondan, & Bornstein, 1999; Pasiak & Menna, 2015). Additional literature has found that children in parent-child dyads that display low dyadic synchrony during interactions are more likely to exhibit problem behaviors (Healey et al., 2010; Im-Bolter et al., 2015; Pasiak & Menna, 2015). For example, in a study of 59 mothers and their 3-6-year-old children, Pasiak and Mena (2015) found that dyads that exhibited more interactional synchrony (coded from mother-child play interactions on a 6-point scale focusing on same focus of attention, mirroring affect, and mutual responsiveness) positively predicted children's social skills (measured via mother report on the Social Skills Rating System). They also found significantly lower levels of dyadic synchrony

among mother-child dyads whose children had clinical levels of aggression, which in turn had a negative association with children's positive social skills. Additionally, they found statistically significant differences in dyadic synchrony by the type of mother-child interaction. Specifically, the mother-child dyad displayed more interactional synchrony during free play interactions compared to a structured block play task. This finding suggests that free play might be a particularly important context for children to develop key social skills as it may lend itself to more opportunities to engage in mutual responsiveness, affect, and attention.

Moreover, in a study with mothers and fathers, Bureau et al. (2014) found that dyadic interactions low in synchrony were associated with disorganized attachment styles, regardless of parent gender. This study suggests that dyadic synchrony is equally important for mother- and father-child dyads in the development of positive parent-child relationships. While this construct has received less attention in the parenting literature, there is mounting, consistent evidence across a variety of samples that this construct is an important indicator of parent-child relationships that facilitates children's social, emotional, and cognitive growth (Harrist & Waugh, 2002).

Joint parent effects

Another important, yet understudied mechanism of influence in the literature, is the joint effects of mothers' and fathers' behaviors on children's developmental outcomes. Studies that examine the main effects of just one parent without including the other are not able to identify these interactions between the effects of mothers and fathers. Those studies that do include both parents, have documented various ways in which mothering and fathering are similar (Cabrera et al., 2014; Cabrera, Volling, &

Barr, 2018; Roggman, 2004; Ryan, Martin, & Brooks-Gunn, 2006), but also instances where their behaviors are different (Cabrera et al., 2018; Cabrera et al., 2020; Joussemet et al., 2008; Malin et al., 2014; Paquette, 2004). Studies have shown that there might be a synergism between parents that produces a multiplicative, also known as joint or interaction effects (Cabrera et al., 2014; Malmberg et al., 2016). This interaction can be of at least two types: *strengthening* where the association between parents and an outcome are stronger when both parents score high on a particular measure and *compensatory or buffering* where the association between the negative association between parenting behavior and a child outcome is buffered or compensated by the high level of parenting from the other parent (Cabrera et al., 2020; Miller et al., 2014). In the context of parents' psychological functioning, it is possible that when both parents are high functioning, the effect would be greater (strengthening hypothesis) than when one parent is high and the other low (compensatory hypothesis).

Studies that examine the joint effects between mothers and fathers are few and limited in scope. Using the Panel Study of Income Dynamics, Kahn et al. (2004) found that the relation between mothers' overall mental health and children's internalizing and externalizing behaviors was substantially weakened when the father reported higher levels of mental health (compensatory effect). This suggests that fathers' mental health may compensate for or buffer the negative effects of poor maternal mental health on children's outcomes. This was not the case for mothers. They found no evidence that maternal mental health buffered the negative effects of fathers' poorer mental health on children. Children were most at risk when both parents reported poor mental health (strengthening effect). Using the Early Childhood Longitudinal Study-Birth Cohort,

Paulson et al. (2006) found evidence to support the joint effects of maternal and paternal depression on parents' play activities with their children. The negative association between maternal depression and playing peekaboo with their children was strengthened when both mothers and fathers experienced greater depressive symptoms. The negative association between paternal depression and singing songs and playing outside with their children was also strengthened when both parents reported greater depressive symptoms. Further, in a study of 101 families, who were mostly white and middle class, and their 7-year-old children, Nelson et al. (2009) examined the effects of both parents' sources of stress on parents' supportiveness when children displayed negative emotions. When testing for parental depressive symptoms as a source of stress, they found support for a compensatory hypothesis. That is, the association between high depressive symptoms of one parent and their partner level of play was reduced when the other parent had lower levels of depression.

Overall, these findings indicate that fathers may play an important role in moderating the effects of mothers' psychological wellbeing on children' development. However, the evidence appears to be mixed for whether mothers also strengthen (or weaken) the effects of fathers. Additional research that attempts to clarify these mixed findings by accounting for the joint effects of mothers' and fathers' psychological functioning on children's social development is needed.

Gaps in the Literature

Overall, this body of literature demonstrates consistent support for the relationship between parents' psychological functioning and children's social development and that this relationship is mediated through various parent-level

mechanisms. Yet, there are still methodological and theoretical gaps in the literature that have yet to be adequately addressed. This review of the literature revealed several limitations, that if addressed, would greatly advance this body of work. First, to capture the ecological nature of these associations, future work should consider the interdependent effects of mothers, fathers, and children on each other in these models. Fathers are embedded within a family's ecology and increasing evidence points to the various ways fathers have independent effects on children's outcomes, yet fathers are consistently neglected from studies of child development. Second, theoretical and empirical work indicate that children make important contributions to the ways in which they are parented through their interactions with their parents, yet these contributions are consistently excluded in the literature due to a unidirectional focus. Third, the vast majority of this literature focuses on specific samples (i.e., African American mothers, families in the rural south). Future work should replicate and expand these findings with more diverse samples to better understand the generalizability and validity of this phenomenon. Fourth, this literature would benefit from a proliferation of studies that utilize observational measures of the quality of parent-child interactions that accounts for the dyadic nature inherent to relationships. Fifth, despite early childhood being a central time period for the development of social skills, this literature largely focuses on older children aged 6 to 12. Additional studies are needed to replicate these findings that examine these outcomes in toddlerhood, when parents and children's relationships are first forming and children are developing key social skills that act as the building blocks for later developmental growth and academic achievement.

Chapter 3: Methods

Data Source

The proposed project uses data from the Baby Books 2 Project (BB2), an ongoing longitudinal randomized control trial of a parenting intervention. BB2 provides first-time, low-income fathers and mothers with “baby books” that have embedded anticipatory guidance (AG) messages. The baby books are designed to be read to children, while the content (i.e., AG information) is for parents about children’s development (i.e., socioemotional, cognitive, and physical development), parenting (i.e., appropriate discipline and safety practices), and coparenting. BB2 also includes information about coparenting and early math skills, both mothers and fathers, and is designed to test for the independent effects of each parent, as well as for any additive and/or multiplicative effects of mothers and fathers together. The BB2 books are designed for children ages 9 to 24 months, an important period of rapid changes in children’s development. Lastly, the BB2 books are bilingual; all content is provided in both English and Spanish. This is particularly important given the growing Spanish-speaking population in the U.S. (Kopack Klein et al., 2017).

BB2 uses a randomized design that includes four conditions that dictate the number and type of books given to families at each time point: (1) educational books are given to both parents (i.e., mothers receive the “mommy” books and fathers receive the “daddy” books); (2) a single educational “mommy” book is given to both parents; (3) a single educational “daddy” book is given to both parents; and (4) a single commercially available book is provided to both parents.

BB2 consists of seven waves of data collection for the intervention occurring when children were 9-, 12-, 15-, 18-, 21-, 24-, and 30-months-old through a series of home visit, phone calls, and online surveys. Within ten days of their child's 9-month birthday (5 days before or after), families were visited in their homes. Mothers and fathers were interviewed separately and were asked various questions about their backgrounds, beliefs, parenting practices, mental health, and their children's health, activities, and behaviors. Nine months later, within ten days of the child's 18-month birthday, families were once again visited in their homes. Mothers and fathers participated in similar interviews and were also each videotaped separately engaging in a parent-child interaction for 10 minutes of free play. Three months following the second home visit, within ten days of when children turned 21-months-old, parents completed phone interviews and online Qualtrics surveys where they were asked a smaller subset of the same questions asked at the previous wave, in addition to questions about their children's socio-emotional development. For my dissertation study, I use data from the first five waves that I helped collect and code.

Sample

Participating families were recruited from centers that administer the Specific Supplement Nutrition Program for Women, Infants, and Children (WIC), health care clinics, ER waiting rooms, parks, and community centers in both the Washington, DC metropolitan area and in Orange County, California. To be eligible for this intervention, parents had to be first time parents of a baby less than 9 months of age, be co-resident, over the age 18, make less than \$75,000 per year, and be literate at a first-grade reading level in either English or Spanish. All infants were born after 35 or more weeks of

gestation. Families were told that the project was aimed at understanding how reading to babies helps them learn and were offered children's books and compensation for their time. Parents were only required to be co-resident at the time of the first home visit. If parents separated over the course of the study, each parent was still eligible to remain in the study and were followed for subsequent data collection activities.

The sample for this study consists of $n= 210$ families consisting of mothers, fathers, and their 9-month-old infants ($n= 420$ parents). The frequencies of the sample's demographic characteristics are outlined in Table 1. Participants in this study are demographically diverse in several ways. Parents are racially and ethnically diverse, with many participants identifying as Latino, African, or African American. Further, the sample includes many immigrant families from a variety of home countries in Central America, South America, the Middle East, and Africa. There is variability in parents' education in this sample as well as annual household incomes (even with the \$75,000 annual income cutoff).

Procedures

Baby Books 2 collects data from mothers and fathers and their first-born child through home visits, telephone interviews, online surveys, videotaped observations of mother- and father-child interactions, and child direct assessments. The present study uses data from the 9-month (baseline), 12-month, 18-month, and 21-month waves of data collection. More specifically, at 9 months, indicators of psychological functioning; at 12-months maternal reports on their children's temperament, specifically their emotionality; at 18-months, videotaped mother- and father-child interactions; and, at 21 months,

parents' reports on social competence and behavior problems. See Table 2 for more information on the measures.

Parent interviews

During the 9- and 21-month data collection waves, both mothers and fathers completed parent interviews to obtain information on their demographic backgrounds, parenting beliefs and practices, and their children. When necessary, the interview was conducted in Spanish by trained bilingual Spanish/English interviewers. While we did not have interviewers that could administer the interview in other languages, all parents had to be at a first-grade literacy level in English and each interview question was read aloud. At 9-months the interviews were conducted in person and at 12- and 21-months the interviews were conducted over the phone and through online surveys.

Parent-child interactions

During the 18-month home visit, mothers and fathers completed the parent-child interaction individually where they were asked to play with their child. The order in which mothers and fathers were asked to play with their child was randomly assigned at baseline and counterbalanced for subsequent waves of in-home data collection. Each parent was asked to sit on a mat with their child, try to ignore the camera, and play as they normally would. They were given two bags of toys and asked to play for five minutes with each bag. They were instructed to only play with the toys in the bag presented to them (Bag A: baby doll, shape sorter, car, helicopter, and a ball; Bag B: cash register, pretend food, and a pretend pizza and pizza cutter). All toys were selected for being age appropriate and were designed to encourage play and talk between parent and child.

Measures

A list of all study measures, type of assessment (i.e., direct, observed, reported), and how they are used the conceptual model (i.e., dependent variable, mediating variable, independent variable, control variable) is outlined in Table 2.

Child social competence and problem behaviors

When children were 21 months old, parents completed phone interviews where they were asked to report on children's socio-emotional competencies and problem behaviors via the 42-item Brief Infant-toddler Social Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006). The BITSEA is a clinical measure designed to assess the presence of children's social-emotional competencies and problem behaviors from ages 12-36 months. Items include dimensions of social-emotional competence (e.g., looks right at you when you say his/her name, helps when someone is hurt). Higher scores on the competency scale indicates more social skills and higher levels on the problem behaviors scale indicates more problems. The BITSEA has been validated with diverse samples and demonstrated high concurrent validity with standardized language assessments (Briggs-Gowan et al., 2004). Further, the BITSEA has been found to have internal consistency coefficients of Cronbach's $\alpha = 0.80$ on the problem behaviors subscale () and Cronbach's $\alpha = 0.69$ for the social competence subscale () when based on both maternal and paternal reports (Karabekiroglu et al., 2010). Both mothers' and fathers' reports on the BITSEA have also been found to be significantly correlated (using Spearman's correlation coefficients) at $\rho = 0.66, p < .001$ for problem behaviors, and $\rho = .63, p < .001$ for social competence (Karabekiroglu et al., 2010). For my dissertation study, the Cronbach's alpha for parent reported problem behaviors at 21 months was

0.60; for social competence it was 0.76. While the internal reliability coefficient, particularly for problem behaviors, is lower than the typically acceptable range of 0.70 to 0.95 (Tavakol & Dennick, 2011), I proceed with including both parents' reports of their children's behavior in the statistical model. The benefits of utilizing multiple informants in addition to the ability to model children's behavior outcomes as a latent factor outweigh the measurement concerns associated with low reliability coefficients. Latent factors, which include multiple indicators or informants, have been found to provide a more complete and reliable measure of the underlying construct compared to single, observed scores on a questionnaire (Hershberger et al., 2003).

Psychological functioning.

Three indicators of parents' psychological functioning were used: depressive symptoms, role overload, and optimism. Depressive symptoms were measured via mother and father self-report on the Center for Epidemiologic Studies Depression Scale Short Form (CESD-SF). The short form consists of 10 items where participants were asked to rate how often they experienced each of the items (e.g., restless sleep, loneliness, sadness) in the past week on a 4-point scale: 0= "rarely or never", 1= "some or a little of the time," 2= "occasionally or a moderate amount of time," and 3= "most or all of the time." For my dissertation study, the Cronbach's alpha coefficients for mothers' reports of depressive symptoms was 0.73 and for fathers it was 0.70.

Parents' role overload or perceptions of being overwhelmed was measured via mother and father self-report on the Role Overload scale. This measure consists of 6 items where participants are asked to rate how often they feel overwhelmed (e.g., I cannot ever seem to catch up) on a 5-point scale from "strongly disagree (1) to "strongly

agree” (5). The Role Overload scale has been found to have high internal consistency reliability coefficients (Cronbach’s $\alpha = 0.87$ to 0.89 ; Thiagarajan et al., 2006). For this study, the Cronbach’s alpha coefficients for parent reports of role overload were 0.78 for mothers and 0.80 for fathers.

Optimism was measured via mother and father self-report on the Positivity Scale. This measure consists of 8 items where participants are asked to rate their agreement with a series of items about how positive or optimistic they feel (e.g., Others are generally here for me when I need them; I feel I have many things to be proud of) on a 5-point scale from “strongly disagree” (1) to “strongly agree” (5). The Positivity Scale was found to have high internal consistency reliability coefficients (Cronbach’s $\alpha = 0.84$ to 0.86). For this study, Cronbach’s alpha coefficients for parent reported optimism were 0.80 for mothers and 0.74 for fathers.

Observed dyadic synchrony

Dyadic synchrony was coded from videotaped mother- and father-child interactions when children were 18 months old. Interactions were coded using the Qualitative Ratings for Parent-Child Interaction coding system (Cox & Crnic, 2003) and rated on a scale from 1 (not at all characteristic) to 5 (highly characteristic). The scales measure both the prevalence and intensity of observed dyadic synchrony. Ratings on the scale are anchored by a brief description of the behaviors that merit that score. Synchrony is conceptualized as the degree of shared experience between the parent and child, which is reflected in the extent of reciprocal play, communication, and shared enjoyment.

Coders underwent a rigorous training and reliability process. Prior to coding the videos included in this study, each coder had to code each training video and be within

one rating of the master coder's rating on 90% of the time. Once they met this threshold, they were assigned a series of videos weekly. The Spanish or bilingual (English/Spanish) videos was coded by a native speaker of Spanish. An additional 20% of all the videos included in this study were double coded by the master coder to ensure consistency and account for any drift over time.

Control variables

To isolate the effects of psychological functioning on children's social development, I included two sets of controls at the family and individual levels. At the family level, I controlled for experimental condition to account for any mean-level differences between treatment and control group participants, even though I am not explicitly testing any effects of the intervention itself. I do not expect to find relational differences among the study variables based on treatment group membership. Parents were randomly assigned to an experimental condition (mom only, dad only, both, or control) at the time of enrollment.

I also controlled for parents' highest level of education as existing literature suggests these are associated with my parent and child level study variables. I also controlled for the quality of the parental relationship via maternal perceptions of their partner's relationship support using six items from the Personal Assessment of Intimacy in Relationships scale (Schaefer & Olson, 1981). Participants are asked to rate on a 1 to 5 Likert scale the extent to which each item describes their relationship (i.e., "My partner listens to me when I need someone to talk to"). For this study, the Cronbach's alpha for maternal reported relationship support at 9 months was 0.76.

At the individual level, I controlled for children's difficult temperament via maternal report on the EAS Temperament scale (Bus & Plomin, 1984; Buss, 1991). Mothers were asked to rate a series of items on a 1 to 5 scale of how characteristic each item is for their child. For this control variable, I used the emotionality subscale which includes items such as: "Child often fusses and cries" or "Child reacts intensely when upset," to represent a difficult temperament. For this study, Cronbach's alpha coefficient for maternal report on child's emotionality at 12 months was 0.64. I also controlled for and father-child dyadic synchrony at 9 months mothers' and fathers' psychological functioning at 18 months. However, it is important to note that only two of the three indicator variables—depressive symptoms and role overload—were asked at the 18-month data collection wave, so parental optimism at age 18 months is not accounted for. I controlled for these variables across time to determine if the pathways of psychological functioning to dyadic synchrony and to children's outcomes remained robust across time, accounting for any contemporaneous associations within the study variables.

Analytic Plan

Prior to running primary analysis, I examined the distribution of study variables, I ran correlations among sociodemographic variables and key study variables to examine the bivariate associations among study variables. See figure 1 for a conceptual model.

Research Question 1: What are the associations between mothers' and fathers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months?

Hypothesis: Mothers and fathers with higher levels of psychological functioning will have toddlers with increased social competence and decreased problem behavior scores compared to mothers and fathers with lower levels of psychological functioning.

Analysis: I conducted latent variable path analysis and created two latent factors—mothers' psychological functioning and fathers' psychological functioning—as the independent variables, indicated by depressive, role overload, and optimism at 9 months, for mothers and fathers. The dependent variables consisted of two latent factors at 21 months—mother and father report of child social competence and problem behaviors, which are two scales of the BITSEA.

Latent variable path analysis is a type of structural equation modeling (SEM) that enables the testing of theoretical causal structures among both latent and measured variables. This approach, compared to other statistical methods such as multivariate regression, is best suited to answering the proposed research questions because it emphasizes the testing of hypothesized casual links that are theoretically supported, allows for the evaluation of any path or a combination of paths to the overall fit of the structural model, and simultaneously identify both direct and indirect pathways (Ullman & Bentler, 2013). Moreover, using latent factors, rather than using measured variable path analysis, is particularly advantageous as it enables you to test the relations among latent constructs (i.e., hypothetical, but unobservable, variables) that reflect their true correlations, free from measurement error (Streiner, 2006). I conducted this latent variable path analysis using Mplus 8.4 (Muthen & Muthen, 2004) using full information maximum likelihood estimation to adjust for missing data. Further, the model was

estimated using maximum likelihood estimation with robust standard errors to help account for any non-normality in the data.

Determining sample size requirements and adequate power within structural equation model can be more challenging than other analytic approaches such as regression models. The many benefits of using a structural equation model, listed above, can make it challenging to develop standards in the field when it comes to sample size; however, a typical guideline that is used in the published literature is to have a minimum sample size of at least 100-200 participants (Anderson & Gerbing, 1984; Boomsma, 1982). More advanced techniques, including model simulations, have been conducted to provide more accurate sample size recommendation, but additional work by Gagne and Hancock (2006) did not find support for an absolute minimum sample size nor the idea that there is a critical ratio of sample size to the number of indicators or free parameters. All in all, research suggests that increases in sample size do improve model convergence, as do increases in loading magnitudes (Gagne & Hancock, 2006). This suggests that models with larger samples, more indicators per factor, and strong factor loadings are all factors that improve parameter estimation and sample size alone is likely not the only aspect to account for when determining statistical power in SEM.

As I include variables from mothers and fathers from the same family, it is likely that a proportion of the error variance in each variable is co-related. . To account for this in the models, I allowed the error terms of mothers' psychological functioning, fathers' psychological functioning, and the interaction term to covary. In addition, I allowed the error terms from mother-, father-child dyadic synchrony social competence, and problem behaviors to covary.

Mother's and fathers' depressive symptom loadings were set to -1 to appropriately scale the factor, and role overload loadings and optimism were constrained to be equal across groups. The 9-month control variables (i.e., 9-month father-child dyadic synchrony, 9-month mother-child dyadic synchrony, study condition, household education, child temperament, and parent relationship quality) were modeled to have direct effect on the two mediator variables (mother- and father-child dyadic synchrony) and the outcome factors (social competence and problem behaviors). Controlling for the effects of these covariates in this way accounts for any potential mean-level differences or associations among the associated variables. These control variables were also modeled to covary with the independent variables (mothers' psychological functioning, fathers' psychological functioning, and mother x father psychological functioning) to account for any potential mean-level differences between the control variables and the independent variables. The 18-month mother and father psychological functioning control variables were modeled to covary with the 18-month dyadic synchrony variables and modeled to depend on all of the 9-month variables and have a direct effect on the outcome factors (social competence and problem behaviors).

To assess the fit of the model, I used three indicators of model fit—the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Residual (SRMR), and the Comparative Fit Index (CFI). I used conservative estimates for adequate model fit statistics, which state that $<.06$ for RMSEA, $<.08$ for SRMR, and $>.95$ for the CFI represent a close-fitting model. Best statistical practices suggest that I should use all three indices to determine whether or not the model fits the data well (Hu & Bentler, 1999). The CFI is an incremental index of fit used to compare the hypothesized

model to a null model (a null model is in one where there are no causal paths between variables). The RMSEA is a parsimonious index of fit that takes into the account the parsimony of the model and is used to determine if the hypothesized model fits the data. A high RMSEA value would reflect a model that may be unnecessarily complex and includes variables in the model that do not explain the outcome, particularly if the model fits well compared to a null model, as determined by a CFI>.95. The SRMR is an absolute fit index and is defined as the average of standardized residuals between observed and hypothesized covariance matrices (Chen, 2007).

Research Question 2: Is the association between mothers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months mediated by mother-child dyadic synchrony at 18 months? Is the association between fathers' psychological functioning at 9 months and toddlers' social competence and problem behaviors at 21 months mediated by father-child dyadic synchrony at 18 months?

Hypothesis 2.1: Mothers who report higher levels of psychological functioning will have toddlers with higher parent-reported social competence and lower problem behavior scores because they exhibit higher dyadic synchrony compared to mothers who report lower levels.

Hypothesis 2.2: Fathers who report higher levels of psychological functioning will have toddlers with higher parent-reported social competence and lower problem behavior scores because they exhibit higher dyadic synchrony compared to fathers who report lower levels.

Analysis: I included two measured variables—mothers’ dyadic synchrony and fathers’ dyadic synchrony—in the SEM model as mediating variables. Specifically, the model tested for the direct paths from mothers’ and fathers’ psychological functioning to children’s social competence and problem behaviors, as well as the indirect paths of psychological functioning to child outcomes, through mothers’ and fathers’ dyadic synchrony. I also tested the significance of the indirect effects using bootstrapping procedures. Unstandardized indirect effects were computed of the 1,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles.

Research Question 3: Is there a joint effect of both parent’s psychological functioning at 9 months on children’s social competence and problem behaviors at 21 months?

Hypothesis 3.1: The positive association between a parent’s (i.e., mother or father) high psychological functioning and toddlers’ social competence will be stronger when the other parent also has high psychological functioning (strengthening hypothesis).

Hypothesis 3.2: The negative association between one parent’s (i.e., mother or father) high psychological functioning and children’s problem behaviors will be stronger when the other parent also has high levels of psychological functioning (strengthening hypothesis).

Hypothesis 3.3: The negative association between a parent’s (i.e., mother or father) low psychological functioning and toddlers’ social competence will be mitigated by high levels of psychological functioning from the other parent (compensatory hypothesis).

Hypothesis 3.4: The positive association between a parent (i.e., mother or father) with low psychological functioning and toddlers' behavior problems will be mitigated when the other parent has high psychological functioning (compensatory hypothesis).

Analysis: To address this research question, I used the product-indicator, unconstrained approach to modeling a latent interaction effect (Kenny & Judd, 1984; Marsh et al., 2013). I chose the unconstrained approach as it produces less biased estimates of the latent interaction effects, compared to the constrained approach which requires more stringent variable conditions, one of which is normality (Marsh et al., 2013). First, I created three interaction terms using the product of mothers' psychological functioning and fathers' psychological functioning indicator variables (i.e., mother depressive symptoms x father depressive symptoms). Each indicator variable was centered prior to creating each interaction term (Marsh et al., 2013). Second, I created a latent factor indicated by each of the three product variables (i.e., mother x father depressive symptoms, mother x father role overload, mother x father optimism). This factor (mother's x fathers' psychological functioning) was allowed to covary with mothers' and fathers' psychological functioning and was modeled to have a direct path to children's social competence and problem behaviors as well as a direct effect on the model mediators, mother-child dyadic synchrony and father-child dyadic synchrony, in addition to the 18-month psychological functioning control variables.

Chapter 4: Results

I organized this chapter in the following way: (1) missing data, (2) descriptive statistics, (3) preliminary analysis, and (4) path analysis.

Missing Data

See table 3 for the missingness breakdown on all study variables. The most amount of missing data (i.e., 42%) was on father's reports of social competence and problem behaviors at 21 months, which was largely due to study attrition. There was also 35% of father-child interaction data missing. Missingness was also due to an inability to complete home visits due to health and safety concerns related to the coronavirus pandemic. These levels of missingness can be handled successfully with Full Information Maximum Likelihood (FIML) as long as data are missing at random. FIML is an approach where missing values are not imputed, but rather they are handled within the model itself. All available information is used to estimate a likelihood function. This approach has been shown to produce unbiased parameter estimates and standard errors (e.g., Graham, 2009).

Exploratory analyses revealed that sample of parents who completed the 21-month data collection did not significantly differ from those who left the study prior to the 21-month data collection in terms of their nativity status, primary home language, annual household income, hours worked, marital status, or education level. There are also no significant differences in parents' reports of the dependent variable (children's problem behaviors and social competence) at 12 months of age between those parents who remained in the study and those who left. They also did not significantly differ based on their reports of psychological functioning (i.e., depressive symptoms, role overload,

and optimism). Further, I ran a cross-tabs analysis of missingness group (1= remained in the study, 0= left the study) by study condition group and find that a fairly equal distribution of participants left the study across the four treatment conditions.

Descriptive Statistics

I conducted descriptive analysis on all study variables when the children were 9-, 12- 18, and 21-months of age. This includes, the mean, median, mode, standard deviation, range, and skewness to determine whether all variables are normally distributed (this information is available upon request). Most of the study variables were normally distributed, except for depressive symptoms, which was somewhat positively skewed and optimism, which was somewhat negatively skewed. Therefore, I used a maximum likelihood estimation with robust standard errors when conducting analysis to deal with this non-normality. Table 1 summarizes the descriptive statistics (M and SD) of the sample, Table 4 summarizes the descriptive statistics of the study variables and Table 5 presents the intercorrelations among study variables.

Sample characteristics

Mothers and fathers self-reported on demographic (e.g., race/ethnicity age, education, income) information. Approximately 48% of the children were boys. At 9 months, fathers and mothers were on average 30-years-old and 28 years old ($M = 27.6$), respectively. The majority of fathers (68%) and mothers (70%) self-identified as Hispanic/Latino, with the next largest group of fathers and mothers (13%) self-identifying as Black, and the remaining parents self-identifying as Asian, multiracial, White, or other. Over half of the sample self-identified as bilingual (English and

Spanish). More fathers than mothers identified only English as their primary language compared to Spanish.

On average, mothers had significantly higher educational attainment than fathers ($t(209) = 5.568, p < .05$), with over half of the mothers reporting at least some college or higher and a quarter having obtained a high school degree. Just about half of fathers had at least some college, a quarter had a high school diploma, and the other quarter had less than high school education. There was a range of household income, with approximately one-quarter of the sample reporting less than \$20,000 per year, approximately a third reporting between \$20-40,000 per year, and the remaining families reporting between \$50-75,000 per year. In addition, 81% of the sample reported receiving WIC benefits (Special Supplemental Nutrition Program for Women, Infants, and Children).

Study variables

On average, fathers and mothers reported fairly low levels of depressive symptoms ($M = 5.03$, range= 0-16, and $M = 5.70$, range= 0-22, respectively. Depressive symptoms are reported as a total score due to the scale's clinical cutoff (the 10 item CES-D has a total possible score of 30, a score greater than 10 indicates clinical levels of depressive symptoms). All other variables are reported as average scores. Fathers and mothers also report similar role overload scores on average ($M = 2.69$ and 2.89 , respectively). A score of 3 out of 5 on the role overload scale suggests that on average, parents are reporting having some feelings of "overloadedness". Fathers and mothers also reported similar optimism scores on average ($M = 4.18$ for both fathers and mothers). An average score of 4 out of 5 suggests on the positivity scale suggests that parents are feeling generally hopeful and optimistic about the future. Paired samples t-tests revealed

that mothers' and fathers' reports of role overload significantly differed ($t(206) = 3.168, p < .01$); however, a statistical significance difference of 0.2 on this 1-5 rating scale does not offer much insight into a meaningful difference in behaviors or characteristics. There were no statistically significant differences in parents' depressive symptoms or optimism. Parents' reports of depressive symptoms and role overload (note that optimism was not asked at the 18-month data collection) remained stable from 9 months to 18 months old. There were no significant differences in depressive symptoms for fathers or mothers at 9 months, but there were significant between parent differences in role overload ($t(139) = 3.06, p < .01$ for fathers; $t(149) = 2.84, p < .01$ for mothers). These mean differences were less than 0.20 and given the rating scale, do not suggest any interpretable or discernable differences in their role overload.

Additionally, on average, both parents received similar ratings on their dyadic synchrony ($M = 3.40$ for fathers and $M = 3.32$ for mothers). Receiving a rating of a 3 on the 5-point rating scale means that dyadic synchrony is "somewhat characteristic" of the interaction (e.g., the dyad shows a mixture of synchronous and asynchronous behaviors, there are some instances where synchrony is lost and not recovered). Ratings on dyadic synchrony between parents do not significantly differ from each other. Dyadic synchrony also remained stable from 9 months to 18 months, revealing no significant differences across time.

Both parents also similarly rated their children's social competence ($M = 17.15$ for fathers, $M = 17.35$ for mothers) and problem behaviors ($M = 12.11$ for fathers and $M = 11.64$ for mothers). These ratings do not statistically significantly differ from each other.

Bivariate correlations

Table 5 shows the bivariate correlations among all study variables. Fathers' depressive symptoms, role overload, and optimism were significantly correlated with fathers' reports of social competence in the expected directions ($r = -.18, p < .05$; $r = -.25, p < .01$; $r = .19, p < .05$ respectively). Father-child dyadic synchrony was positively and significantly correlated with fathers' reports of social competence ($r = .21, p < .01$; $r = .19$), suggesting that father-child dyads who exhibited more synchrony during play had fathers who reported greater social competencies and fewer problem behaviors in their children ($r = -.22, p < .01$).

For mothers, depressive symptoms and role overload were significantly correlated with mothers' reports of children's problem behaviors ($r = .26, p < .01$; $r = .34, p < .01$, respectively). Mothers who reported more depressive symptoms and feelings of being overwhelmed were more likely to report that their children exhibited problematic behavior. Whereas maternal optimism was negatively related to reports of problem behaviors ($r = -.21, p < .01$), so mothers who were more optimistic and hopeful were less likely to report behavior problems in their children. Mothers reports of role overload and optimism were significantly correlated with mothers reports of social competence ($r = -.24, p < .01$; $r = .21, p < .01$, respectively) in the expected directions (i.e., more optimistic mothers reported their children had more social competence, while mothers who reported greater role overload reported that their children had less social competence).

Additionally, there were a few significant associations across parents' reports of children's outcomes. Fathers' depressive symptoms were associated with maternal

reports of problem behaviors ($r = .25, p < .01$), so fathers who reported more depressive symptoms had children whose mothers perceived them as exhibiting greater problematic behaviors. Mother-child dyadic synchrony was positively and significantly correlated with fathers' reports of social competence ($r = .21, p < .01$) and negatively associated with fathers' reports of problem behaviors ($r = -.36, p < .01$), but mother-child dyadic synchrony was not significantly associated with mothers' own reports of child behavior.

Turning to the control variables. Parents' relationship support (mother-reported) was significantly correlated with fathers' depressive symptoms ($r = .15, p < .05$) and mothers' role overload ($r = .24, p < .01$) at 9 months. Children's emotionality was significantly correlated with mothers' depressive symptoms ($r = .21, p < .01$), role overload ($r = .29, p < .01$), and optimism ($r = -.20, p < .01$) at 9 months, as well as mother-child dyadic synchrony ($r = -.25, p < .01$) and mother reports of child social competence ($r = -.29, p < .01$) and problem behaviors ($r = .33, p < .01$). Fathers' depressive symptoms at 9 months was correlated with fathers' depressive symptoms ($r = .43, p < .01$) and role overload ($r = .40, p < .01$) at 18 months, as well as mothers' depressive symptoms ($r = .35, p < .01$) and role overload at 18 months ($r = .22, p < .01$). Fathers' role overload at 9 months was also correlated with fathers' role overload ($r = .61, p < .01$) at 18 months and mothers' depressive symptoms at 18 months ($r = .22, p < .01$). Fathers' reports of social competence were associated with fathers' depressive symptoms ($r = -.22, p < .01$) and role overload ($r = -.28, p < .01$) at 18 months, as well as mothers' role overload ($r = -.29, p < .01$) at 18 months. Fathers' reports of problem behaviors were also associated with fathers' role overload ($r = .24, p < .01$) at 18 months. Similarly, mothers' depressive symptoms at 9 months were correlated fathers' role

overload ($r = .19, p < .05$), mothers' depressive symptoms ($r = .53, p < .01$), and mothers' role overload ($r = .23, p < .01$) at 18 months. Mothers' role overload at 9 months was also associated with fathers' depressive symptoms ($r = .24, p < .01$), fathers' role overload ($r = .37, p < .01$), mothers' depressive symptoms ($r = .39, p < .01$), and mothers' role overload ($r = .62, p < .01$) at 18 months. Finally, mothers' reports of social competence were associated with mothers' role overload ($r = -.32, p < .01$) at 18 months and mothers' reports of problem behaviors was associated with her own depressive symptom ($r = .35, p < .01$) and role overload ($r = .26, p < .01$) at 18 months.

Preliminary Analysis

To determine whether the measures of mother and father psychological functioning—depressive symptoms, role overload, and optimism—were appropriate indicators of these constructs, I ran a confirmatory factor analysis (CFA). I ran the CFA using maximum likelihood estimation with robust standard errors. Overall, the model had marginal fit, with two of the three fit indices meeting the conservative minimum thresholds for fit. The SRMR= .05 which is below the conservative cutoff (i.e., < 0.08) and the CFI= .98 which is above the conservative cutoff (i.e., $\geq .95$). The RMSEA= .07 (90% CI [.00 – 0.13]) indicates mediocre fit as it is slightly higher than the conservative cutoff ($< .06$). Additionally, the each indicator loaded adequately onto the factor in the expected directions: optimism at -.61 for fathers and -.56 for mothers, depressive symptoms at .74 for fathers and .85 for mothers, and role overload at .64 for fathers and .50 for mothers (the loadings listed are standardized loadings).

Path Analysis

I conducted a latent variable path model to identify the associations among study variables outlined in research questions 1, 2, and 3. The model included the following set of variables: (1) the control variables: parent education, study condition, parental relationship support, child emotionality, 9-month mother-child dyadic synchrony, 9-month father-child dyadic synchrony, 18-month mother psychological functioning, 18-month father-psychological functioning); (2) the exogenous or independent variables: mothers' psychological functioning, fathers' psychological functioning, and the interaction term (mother x father psychological functioning) at 9 months; (3) the mediators: mother- and father-child dyadic synchrony at 18 months; and, (4) the endogenous or dependent variables: social competence and problem behaviors as latent factors, indicated each by mother and father reports at 21 months.

Table 6 shows the direct effects of the study variables on children's social competence and problem behaviors. Figure 2 depicts the standardized path coefficients for the model. The overall path model has marginal fit as two of the three fit indices met the conservative minimum thresholds for fit. Specifically, the RMSEA = .046 (90% CI [0.03- 0.06]), SRMR= 0.054, and CFI = 0.90. The CFI below the ideal value of 0.95 suggests that the variables included in the model may have low relations to each other. However, the RMSEA and SRMR values are below the ideal values of <.06 and <.08 respectively (Hu & Bentler, 1999).

Testing the direct paths

To address the first research question that mother and father psychological functioning have a direct effect on children's social competence, I examined the direct

path between mothers' and fathers' psychological functioning at 9 months and children's social competence and problem behaviors at 21 months. Results revealed no significant direct effects of mothers' psychological functioning on children's social competence or problem behaviors nor of fathers' psychological functioning on children's social competence nor problem behaviors.

Testing the mediation path

To address the second research question that parent-child dyadic synchrony at 18 months mediated the associations between parents' psychological functioning at 9 months and children's social competence and problem behaviors at 21 months, I examined the indirect effect of parent psychological functioning and child outcomes through dyadic synchrony. There was not a significant specific indirect effect between mothers' psychological functioning and children's social competence ($\beta = 0.01$, 95% CI [-0.63, 0.88], $p > .05$) or between mothers' psychological functioning and problem behaviors ($\beta = -0.009$, 95% CI [-2.71, 1.099], $p > .05$) through mother-child synchrony. Similarly, for fathers there was not a significant specific indirect effect of fathers' psychological functioning on social competence ($\beta = -0.006$, 95% CI [-1.04, 0.272], $p > .05$) or problem behaviors ($\beta = 0.009$, 95% CI [-1.16, 2.11], $p > .05$) through father-child dyadic synchrony.

Testing joint effects

I tested two hypotheses—the strengthening hypothesis and the compensatory hypothesis—associated with my third research question asking whether there were joint effects of parents' psychological functioning on children's social competence and problem behaviors. The strengthening hypothesis states that when both parents had high

psychological functioning or alternatively, both had low psychological functioning, the magnitude of the association between psychological functioning and children's social competence and problem behaviors would be strengthened. The compensatory hypothesis suggests that the association between the low psychological functioning from one parent and children's social competence and problem behaviors will be mitigated by high levels of psychological functioning from the other parent. There were also no significant effects of the joint effect (tested as interaction factor) on either social development outcome or behavior problems.

Testing Alternate Pathways

While outside the scope of this study's research questions, the model does include alternate pathways to help account for the various ways that parent's psychological functioning could reach children's outcomes and the theoretically supported interrelations among the study variables (see Table 7). I do find that mothers' and fathers' psychological functioning at 9 months significantly predicts their psychological functioning at 18 months ($\beta = 0.79, p < .01$ and $\beta = 0.82, p < .01$ respectively). However, I do not find a significant direct effect of mother- nor father-child dyadic synchrony at 9 months on dyadic synchrony at 18 months.

Chapter 5: Discussion

Guided by the bioecological model that children are embedded within an intersecting environmental system that shapes their developmental trajectory, I examined the longitudinal associations between mothers' and fathers' psychological functioning at 9 months, parent-child dyadic synchrony at 18 months, and toddlers' subsequent social skills at 21 months.

First, I investigated main effects of psychological functioning on children's social competence (e.g., following rules; expressing affection) and problem behaviors (e.g., destroying things on purpose; hitting, biting, or kicking their parent). I found no significant support for the main effect hypotheses that mothers' and fathers' psychological functioning at 9 months is significantly related to children's social competence and problem behaviors at 21 months. My findings are somewhat inconsistent with past findings that have found a link between maternal psychological functioning and youth's developmental outcomes (Brody et al., 2002; Brody & Flor, 1997; Mistry et al., 2002). Unlike my study that focused on a diverse sample of two-parent families, past studies included mostly single-parent households and only tested the effects of mothers on their children (Baker & Iruka, 2013; Brody et al., 2002; Brody & Flor, 1997; Murry et al., 2001). However, in one of the few studies that included both parents, Papp et al. (2005) also did not find a significant direct effect of mothers' and fathers' psychological distress on children's adjustment problems (children ranged in age from 8-16-years-old). Taken together, these findings suggest that neglecting to include fathers in their statistical models could be overestimating the effects of mothers' psychological wellbeing on their children. Additionally, my findings suggest that at this age for children who are living

with both of their parents, the psychological functioning of their parents does not have a substantial influence on their social development skills.

Second, I examined whether mother-child and father-child dyadic synchrony mediated the association between parents' psychological functioning and children's social competence and problem behaviors. I sought to test an alternate pathway between psychological functioning and children's social development that had yet to be tested in the extant literature and did not find significant evidence to suggest that dyadic synchrony is a mechanism through which psychological functioning in parents influences their children's social competence or problem behaviors. Most studies that found statistical support for indirect pathways between psychological functioning and child outcomes through parenting practices, examined developmental outcomes in children aged 6- to 12-years-old (Brody & Flor, 1997; Brody et al., 2002; Baker & Iruka, 2013; Mistry et al., 2002). A possible explanation for the lack of statistical significance in the current study may be the developmental period examined. For many parents, the infancy and early childhood period, while a time of adaption and adjustment, is also a time of joy and awe. As children get older, they demand more from their parents, which may be particularly challenging for parents experiencing poorer psychological functioning. Another possible explanation for the discrepancy between my study and the previous studies is that these past studies did not adequately control for the possible longitudinal effects of key variables over time. For example, no studies controlled for the effects of psychological functioning at time 1 on psychological functioning at time 2 or the concurrent associations of psychological functioning at time 2 on parenting at time 2. Models that do not control for these variables at multiple timepoints do not account for

the possible influence of parents' psychological functioning or parenting behaviors across time and so it is possible that the indirect effects found in previous studies may be less robust than initially reported. All in all, my findings suggest that dyadic synchrony between parent-child dyad may not be mechanism through which psychological functioning influences toddlers' later social development skills, as reported by their parents.

Third, I tested two hypotheses on the joint effects of both mothers and fathers psychological functioning on children's social development outcomes. I did not find significant statistical support for either the strengthening or compensatory hypotheses. I expected that the associations between parents' psychological functioning would be strengthened in the context of both parents reporting high functioning (or when both parents reported low functioning). I also expected that the low psychological functioning of one parent would be mitigated by high psychological functioning in the other parent. In other words, parents' contributions were not found to be additive. Some previous studies have found support for joint effects between mothers and fathers experiencing depressive symptoms on children's development, both in infancy (Paulson et al., 2006) and in a sample of children ranging in age from 3 to 12-years-old (Kahn et al., 2004). However, another longitudinal study that examined the joint effects of parents' cognitive stimulation activities with their infants and toddlers also did not find joint effects (Cabrera et al., 2020). There are a few possible explanations for the lack of statistical support for these hypotheses. It is possible that at this age, parents' psychological functioning is not the main driver of infants' behaviors, particularly among this sample of seemingly well-adjusted families. It is also possible that the lack of significant effects

found in this study could be due to measurement. In previous literature, there are discrepancies in the ways in which psychological functioning is measured. While the measures I selected to indicate psychological functioning loaded well onto the factor and aligned with the measurement of psychological functioning used in other studies, it is possible that the slight differences in the conceptualization of this construct yielded the inconsistent results. Additionally, the measures used in this study are validated and reliable measures of the constructs they sought to capture; however, the measures of depression and optimism lacked some variability among this sample. For example, few parents reported experiencing depressive symptoms that met the clinical cutoff, suggesting that this is not a particularly depressed sample. Many parents also reported that they were generally hopeful and optimistic about the future. Perhaps, their optimism is acting as a protective factor for this sample of parents, particularly for their mental health. Moreover, while the BITSEA is appropriate for use with toddlers as young as 12 months, toddlers in this study had few reported problem behaviors and overall were reported as being socially competent. It is possible that children at this age have yet to exhibit behaviors that parents are perceiving as problematic, but also suggests this was not a sample with clinical levels of issues. In general, this was not a particularly at-risk sample of families. Parents were co-resident, did not report clinical levels of distress, and while many experienced at least some economic disadvantage, it appears that many had necessary coping skills and supports.

This study adds to the literature in several ways. First, an emerging literature is beginning to frame studies that include low-income populations from a strengths-based perspective (Hamby, 2020; Sheely-Moore & Bratton, 2010), rather than focusing on

deficits that emphasize risk in vulnerable populations. This study focuses on parents' characteristics and family processes that are working well in this economically, racially, and ethnically diverse sample of mothers, fathers, and their toddlers. Second, this study also makes an important contribution to the literature, as it includes both mothers and fathers and simultaneously tests for both parents' effects. While the evidence on the effects of fathers on their children's development continues to expand, there are still few studies that test the mechanisms through which fathers' wellbeing may influence child wellbeing. It is important to include fathers in these studies as excluding them from these statistical models may overestimate the effect of mothers and researchers, practitioners, and policymakers may be missing an important influence in children's lives to engage in preventive interventions.

This study offers evidence in support of programs and policy efforts focused on prevention. Continued efforts should be made to encourage parents when they are doing well and work to strengthen existing supports so they can be deployed if parents encounter additional challenges down the road. These findings could also help inform the work of Healthy Marriage and Relationship Education programs (i.e., federally funded programs aimed at supporting strong and healthy family relationships in families with low income; Cabrera et al., 2021) by demonstrating that fathers are warm, engaged, and involved parents in their young children's lives. It is also possible, that this particular population of families, would be particularly susceptible to the beneficial effects of some of these programs by capitalizing on what is already working well (e.g., positive psychological wellbeing, positive parent-child interactions) to further strengthen the family system and build capacity in the face of economic pressures.

Limitations and Future Directions

Though this study contributed to the literature examining parental psychological functioning and toddlers' emerging social skills, there are limitations that must be acknowledged. First, as is the case with any longitudinal study, the Baby Books 2 Project faced sample attrition over time. It was further impacted by the coronavirus pandemic, which severely limited data collection opportunities for some families. While the missing data was determined missing at random and subsequently handled by full information maximum likelihood within the structural equation model, the missing data, particularly from fathers was still a potential limitation.

Second, the self-reported nature of many of these measures may also be a limitation. For example, the lack of variability in the BITSEA reports could be due to relying on parent reports, opposed to reports from teachers or daycare providers. Previous research has found that teachers may be more reliable reporters of children's behaviors because they are able to rate a specific child in relation to other children in general, whereas parents, especially first-time parents, do not have comparison children in which to reference their children's behaviors (Achenbach et al., 1987; Heyman et al., 2016). Therefore, it is possible that parents are either under or over reporting their children's social competencies or problem behaviors. However, it is important to note that mothers and fathers aligned in their BITSEA reports and there were no significant differences across mothers and fathers average scores on problem behaviors or social competencies.

Third, it is important to acknowledge that this is a select sample of parents who agreed to participate in a study about reading to their children. The majority of these parents were also recruited from WIC centers, so many of them were already aware of

and utilizing supports and resources, which may explain why our sample was relatively higher functioning. Moreover, the eligibility requirements of the larger intervention study (i.e., two-parent families, co-resident at baseline, literate at a first-grade reading level) predisposed the sample to meet certain characteristics that also could explain why these families report that their children are relatively socially competent with few problem behaviors.

Finally, despite the ecological approach of this study, it is possible that there are additional family ecologies or associations that may be important for children's social development that remained unexamined in this study. While I did not find support for the overall model that parent-child dyadic synchrony mediated the relationship between mothers' and fathers' psychological functioning on children's social development, I caution against interpreting this lack of evidence as an absence of a promising path for future studies further examining these relationships. There are several relationships that could be explored in future studies that were outside the scope of this study. Additional contextual variables, such as neighborhood or community safety, parents' employment characteristics like job satisfaction or work hours, or the effects of culture on parents' wellbeing and parent-child relationships could also be important variables to consider.

Conclusions

The goal of this study was to examine the mechanisms through which parents' psychological functioning reached children's socio-emotional outcomes. Using a theory-based structural equation model with a longitudinal design, this study tested the direct effects of parents' psychological functioning on toddlers' social competence and problem behaviors, the mediating role of dyadic synchrony in these associations, and the joint

effects of mothers' and fathers' psychological functioning on children's outcomes. While I did not find statistically significant support for study hypotheses, this study broadens our understanding of this area of research—both methodologically and theoretically—in four ways; (1) by including observational measures of the quality of the parent-child relationship at the dyadic level; (2) by seeking to replicate and expand previous findings using a diverse sample of two-parent families that simultaneously accounts for both mothers' and fathers' contributions to children's social competence and problem behaviors; (3) by focusing on early childhood, a time that is critical for the development of social skills; and (4) by framing this study from a strengths-based approach and acknowledging the variability within diverse families.

Efforts to support positive parent-child relationships and healthy child development can be supplemented with interventions aimed at increasing positive psychological functioning in both mothers and fathers and promoting parent-child interactions that are in-tune, synchronous, and reciprocal. These results imply that this field of research should continue to draw upon and work to build theory that specifically acknowledges fathers as parents and as key influencers on their children's lives. Future research and work should utilize these findings to develop and test interventions that specifically aim to include fathers in their programs.

Tables

Table 1. Sample Characteristics at Baseline

Measure	All Parents (n= 420) M(SD)/%	Fathers (n= 210) M(SD)/%	Mothers (n= 210) M(SD)/%
Child is a boy	48%	--	--
Parent Age	28.8 (6.9)	30.0 (6.8)	27.6 (5.7)
<i>Race or Ethnicity</i>			
Hispanic/Latino	68%	68%	70%
Black	13%	13%	13%
Asian	5%	6%	4%
Multiracial	5%	4%	6%
White	7%	8%	7%
Other	2%	2%	3%
<i>Primary Language</i>			
English	15%	18%	12%
Spanish	12%	10%	14%
Bilingual: English/Spanish	61%	61%	61%
Bilingual: English/Other	12%	12%	13%
<i>Parent Education</i>			
Less than high school	17%	24%	10%
Completed high school	24%	26%	23%
Some college	39%	35%	42%
4-year degree or higher	21%	15%	26%
<i>Family Income</i>			
\$10,000 or less	10%	6%	15%
\$10,001 to \$20,000	15%	14%	17%
\$20,001 to \$30,000	18%	19%	19%
\$30,001 to \$40,000	16%	16%	17%
\$40,001 to \$50,000	12%	16%	10%
More than \$50,000	25%	29%	22%

Table 2. List of Study Measures

Construct	Time	Role in Study	Method of Assessment	Measures	# of Items
Depressive Symptoms	9 months	Independent Variable	Mother & Father Report	Center for Epidemiologic Studies Depression Scale Short Form (CESD-SF; Kohout et al., 1993)	10
Role Overload	9 Months	Independent Variable	Mother & Father Report	Role Overload Scale (Thiagarajan et al., 2006)	6
Optimism	9 Months	Independent Variable	Mother & Father Report	The Positivity Scale (Caprara et al., 2012)	8
Dyadic Synchrony	18 Months	Mediating Variable	Observed	Qualitative Ratings for Parent-Child Interaction (Cox & Crnic, 2003)	--
Child Social Competence	21 Months	Dependent Variable	Mother & Father Report	Brief Infant-Toddler Social Emotional Assessment (BITSEA) (Briggs-Gowan & Carter, 2006)	11
Child Problem Behaviors	21 Months	Dependent Variable	Mother & Father Report	Brief Infant-Toddler Social Emotional Assessment (BITSEA) (Briggs-Gowan & Carter, 2006)	31
Experimental Condition	9 Months	Control Variable	Randomly Assigned	Randomly assigned at enrollment	1
Parent Education	9 Months	Control Variable	Mother & Father Report	How many years of education have you completed?	1
Relationship Support	9 Months	Control Variable	Mother Report	Subset of items from the PAIR Inventory (Schaefer & Olson, 1981)	6
Child Emotionality (Temperament)	12 Months	Control Variable	Mother Report	EAS Temperament Scale- Emotionality subscale (Buss & Plomin, 1984; Buss, 1991)	5
Depressive Symptoms	18 Months	Control Variable	Mother & Father Report	Center for Epidemiologic Studies Depression Scale Short Form (CESD-SF; Kohout et al., 1993)	10
Role Overload	18 Months	Control Variable	Mother & Father Report	Role Overload Scale (Thiagarajan et al., 2006)	6

Table 3. Missingness Breakdown

	Individual Parents	Fathers	Mothers
	N (% missing)	N (% missing)	N (% missing)
Completed Wave 1 data collection	420 (0%)	210 (0%)	210 (0%)
Completed Wave 4 interaction data collection	263 (32%)	137 (35%)	148 (30%)
Completed Wave 5 data collection	269 (36%)	121 (42%)	148 (30%)

Table 4. Descriptive Statistics of Study Variables

Measure	Fathers		Mothers	
	M(SD)	Range	M(SD)	Range
Depressive Symptoms	5.03 (3.97)	0-16.00	5.70 (4.42)	0-22.00
Role Overload	2.69 (0.76)	1.00-5.00	2.89 (0.74)	1.00-4.67
Optimism	4.18 (0.47)	2.63-5.00	4.18 (0.51)	2.38-5.00
Dyadic Synchrony	3.40 (0.90)	1.00-5.00	3.32 (0.87)	2.00-5.00
Social Competence	17.15 (2.53)	9.00-22.00	17.35 (2.94)	5.00-22.00
Problem Behaviors	12.11 (6.59)	2.00-36.00	11.64 (6.76)	0.00-36.00

Note: Average scores reported except for depressive symptoms where total score is reported due to clinical significance.

Table 5. Intercorrelations of model variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	
1. F Depressive Symptoms	1.00																						
2. F Role Overload	.49* *	1.00																					
3. F Optimism	-.40* *	-.37* *	1.00																				
4. F-C Dyadic Synchrony	0.02	0.03	0.01	1.00																			
5. F Prob. Behaviors	0.12	0.05	0.12	-0.18	1.00																		
6. F Social Comp.	-.182 *	-.25* *	.19*	.21*	-.29* *	1.00																	
7. M Depressive Symptoms	.22* *	.174 *	-.18* *	-0.03	0.01	-0.01	1.00																
8. M Role Overload	.24* *	.30* *	-.25* *	-0.13	0.07	-.20*	.41* *	1.00															
9. M Optimism	-0.07	-0.07	.15*	0.02	0.04	0.13	-.53* *	-.30* *	1.00														
10. M-C Dyadic Synchrony	0.07	-0.01	0.04	-.31* *	-.36* *	.23*	-0.09	-0.05	0.06	1.00													
11. M Prob. Behaviors	.25* *	0.10	0.02	-.22*	.41* *	-.32* *	.26* *	.34* *	-.21* *	-0.17	1.00												
12. M Social Comp.	-0.06	-0.02	0.04	.19*	-0.18	-.47* *	-0.06	-.24* *	-.21* *	0.15	-.42* *	1.00											
13. Experimenta l Condition	-0.01	0.07	-0.03	-0.01	0.00	-0.06	0.08	0.00	-0.03	-0.07	-0.04	0.00	1.0 0										
14. Parent Education	-0.03	0.08	-0.02	0.02	-0.01	-0.11	-0.10	0.09	0.09	0.15	-0.05	-0.06	-.00 6	1.0 0									
15. Relationship Support	.15*	0.10	-0.08	-0.02	0.07	0.03	-.24* *	0.09	-0.02	0.05	0.09	-0.02	-.00 2	-.01 3	1.00								
16. Child Emotionalit y	0.11	0.02	-0.11	-0.12	0.15	-0.13	.21* *	.29* *	-.20* *	-.25* *	-.33* *	-.29* *	-.00 3	-.00 4	-0.07	1.00							
17. F-C Dyadic Synchrony (9M)	-0.00	.13	-0.06	.07	-0.01	-0.01	-0.10	-0.11	.03	.15	-0.20	.09	-0.06	.08	-0.03	-0.09	1.0 0						

18. M-C Dyadic Synchrony (9M)	.10	.08	-.09	-.04	-.04	-.05	.04	-.05	-.04	.01	-.13	.04	-.09	-.11	.01	.03	.12	1.00				
19. F Depressive symptoms (18M)	.43*	.43*	-.37*	-.00	.14	-.22*	.12	.24*	-.11	-.03	.15	-.15	.05	-.04	.12	.15	.14	.08	1.00			
20. F Role Overload (18M)	.40*	.61*	-.31*	-.04	.24*	-.28*	.19*	.37*	-.01	.04	.17	-.10	-.10	.16	.18*	.15	.07	.01	.43*	1.00		
21. M Depressive symptoms (18M)	.35*	.22*	-.24*	-.01	.11	-.09	.53*	.39*	-.39*	-.09	.35*	-.07	.06	-.09	.21*	.24*	-.12	.01	.27*	.33*	1.00	
22. M Role Overload (18M)	.22*	.15	-.25*	-.15	.02	.29*	.27*	.62*	-.29*	-.05	.26*	-.32*	.03	.11	-.10	.31*	-.07	.00	.19*	.32*	.44*	1.00

* $p < .05$, ** $p < .01$

Notes: F= father. M= mother. C= child. Prob. Behaviors= problem behaviors. Social Comp.= social competence. 9M= 9 months. 18M= 18 months.

Table 6. Direct effects on children's social competence and problem behaviors

	Children's Social Competence			Children's Problem Behaviors		
	B	SE B	β	B	SE B	β
M Psychological Functioning	-2.01	7.05	-0.28	1.26	7.99	0.12
F Psychological. Functioning	-3.57	10.12	-0.49	-2.77	13.06	-0.25
M x F Psychological Functioning	0.78	7.18	0.04	-7.18	7.40	-0.25
M-C Dyadic Synchrony	0.47	0.40	0.23	-0.40	1.03	-0.13
F-C Dyadic Synchrony	0.26	0.34	0.12	-0.41	0.46	-0.13
Parent Education	-0.16	0.37	-0.08	-0.15	0.51	-0.05
Experimental Condition	-0.24	0.35	-0.12	-0.25	0.39	-0.08
Relationship Support	0.38	1.54	0.18	1.09	1.70	0.34
Emotionality	-0.01	0.11	-0.005	0.09	0.13	0.03
M-C Dyadic Synchrony (9M)	-0.07	0.30	-0.03	-0.55	0.42	-0.17
F-C Dyadic Synchrony (9M)	0.04	0.37	0.02	-0.14	0.41	-0.04
M Psychological Functioning (18M)	3.31	8.69	0.45	-6.12	9.94	-0.59
F Psychological. Functioning (18M)	6.09	12.46	0.78	2.47	17.25	0.21

Note: M= Mother. F= Father. C= Child. 9M= 9 months. 8M= 18months.
 RMSEA= 0.046 (90 % CI [0.03, 0.06]), SRMR= 0.054, CFI= 0.90

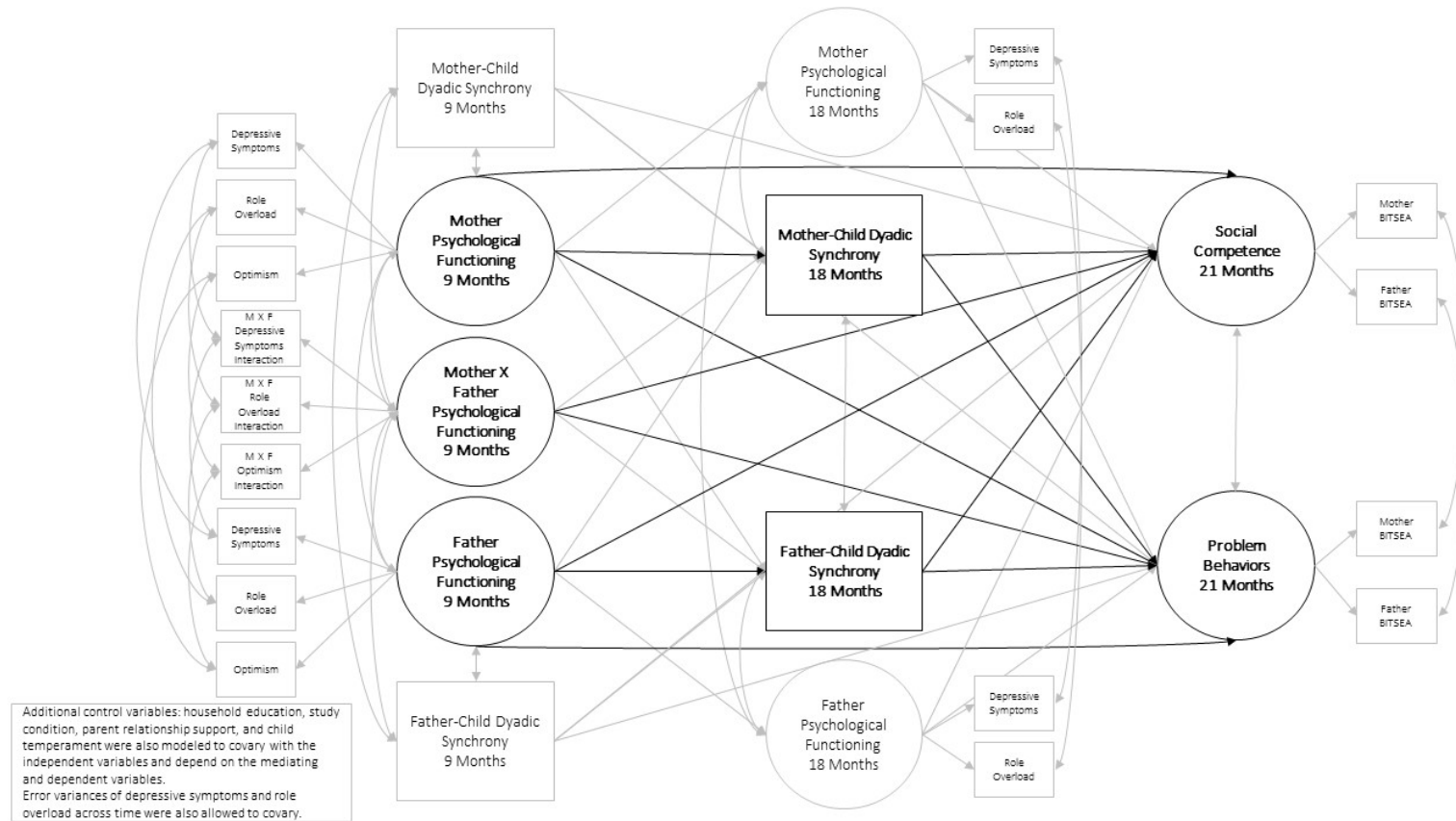
Table 7. Direct effects of 9 month variables on 18 month variables

	Mother-Child Dyadic Synchrony (18M)			Father-Child Dyadic Synchrony (18M)			M Psychological Functioning (18M)			F Psychological Functioning (18M)		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
M Psychological Functioning (9M)	0.02	0.37	0.01	0.37	0.51	-0.01	0.79**	0.13	0.32	0.06	0.17	0.07
F Psychological Functioning (9M)	0.09	0.36	0.03	-0.02	0.38	0.11	0.12	0.14	0.12	0.82**	0.14	0.88
M x F Psychological Functioning (9M)	1.04	0.65	0.12	1.96*	0.95	0.22	-0.56	0.41	-0.22	0.04	0.31	0.02
Parent Education	0.12	0.09	0.12	-0.02	0.09	-0.02	-0.02	0.03	-0.06	-0.03	0.03	-0.10
Experimental Condition	-0.04	0.07	-0.04	-0.03	0.07	-0.03	0.004	0.02	0.01	0.03	0.02	0.09
Relationship Support	0.04	0.17	0.04	-0.11	0.23	-0.11	0.08	0.07	0.32	-0.06	0.06	-0.24
Emotionality	0.06**	0.02	-0.06	-0.02	0.03	-0.02	-0.01	0.01	-0.02	-0.01	0.01	-0.03
M-C Dyadic Synchrony (9M)	0.02	.006	0.02	-0.03	0.07	-0.03	-0.01	0.02	-0.02	0.01	0.02	0.04
F-C Dyadic Synchrony (9M)	0.08	0.07	0.08	0.03	0.08	0.03	0.01	0.02	0.02	-0.01	0.02	-0.05

* $p < .05$, ** $p < .01$, † $p < .10$

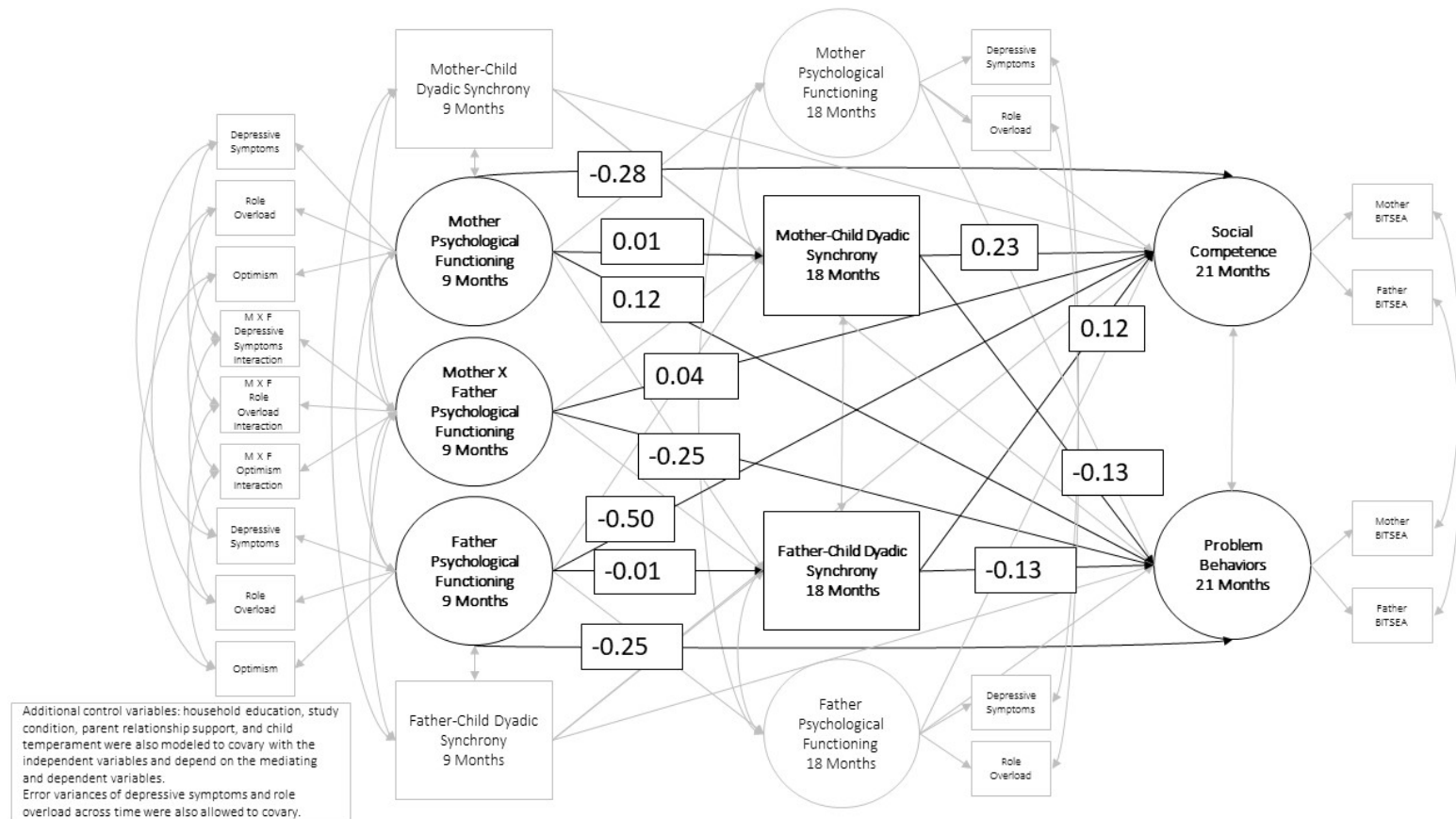
Note: M= Mother. F= Father. C= Child. 9M= 9 months. 8M= 18months.

Figure 1. Conceptual Model



Note: Light grey paths indicate relationships that are theoretically supported and were tested in the model, but no specific hypotheses were made regarding these paths as they were outside the scope of this dissertation. Please note that covariances depicted in this diagram represent covarying error terms, not the variables themselves.

Figure 2. Path diagram with standardized coefficients



Note: Light grey paths indicate relationships that are theoretically supported and were tested in the model, but no specific hypotheses were made regarding these paths as they were outside the scope of this dissertation. Please note that covariances depicted in this diagram represent covarying error terms, not the variables themselves.

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