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Pregnancy Intentions of First Time Mothers: Depressive Symptoms, Parenting Stress, Coparenting Satisfaction, and Child Behavioral Outcomes over the First Three Years

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PREGNANCY INTENTIONS OF FIRST TIME MOTHERS: DEPRESSIVE SYMPTOMS, PARENTING STRESS, COPARENTING SATISFACTION, AND CHILD BEHAVIORAL OUTCOMES OVER THE FIRST THREE YEARS

By

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For Shaffer, my incredible husband and best friend.
You are my rock and my motivation.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Unplanned pregnancy is prevalent in the United States and has been linked to challenges for both mothers and their children over time. However, existing literature is limited by unrepresentative samples, retrospective reports of pregnancy intention, and lack of theoretical guidance. Studies have not yet identified mechanisms through which pregnancy intention is associated with children's outcomes, to sufficiently inform clinical practice. This current study addressed these limitations through inclusion of an at-risk sample of 224 first time mothers from the *Predicting and Preventing Neglect in Teen Mothers Study*, assessing pregnancy intention during the third trimester of pregnancy, and testing mechanisms in the association between pregnancy intention and children's outcomes which were hypothesized by Family Systems Theory. The study also examined reciprocal associations among hypothesized mediators, including maternal depressive symptoms, parenting stress, and coparenting satisfaction. Mediation analyses revealed that both parenting stress and coparenting satisfaction when children were 24 months old served as mechanisms in the association between unplanned pregnancy and children's social-emotional competence at 36 months. Additionally, a cross-lagged longitudinal model suggested multiple pathways through which unplanned pregnancy was associated with children's externalizing, internalizing, dysregulation, and social-emotional competence at 36 months. Maternal depressive symptoms tended to predict later parenting stress which, in turn, was associated with later coparenting satisfaction and children's behavioral outcomes. Implications for future research are discussed, including collection of data from multiple respondents and assessment of pregnancy intention prospectively. Clinical implications for work with at-risk parents are also outlined. Specifically, the results suggest that early intervention with mothers experiencing unplanned

pregnancies to specifically address depressive symptoms, parenting stress, and coparenting may serve to promote healthy outcomes among their children over time.

CHAPTER ONE

INTRODUCTION

Unplanned pregnancy is prevalent in the United States (U.S.) and worldwide. In fact, in 2008, 41% of worldwide pregnancies and 48% of U.S. pregnancies were unplanned (Singh, Sedgh, & Hussain, 2010). State-level estimates suggest that the median rate of unplanned pregnancies across U.S. states is 53% (Finer & Kost, 2011), with rates highest in states with large proportions of young, unmarried, and minority women of childbearing age (Kost, Finer, & Singh, 2012). The majority of unplanned pregnancies are carried to term and result in births (Singh et al., 2010). Therefore, it is important to examine the parental and child outcomes associated with unplanned pregnancy.

Existing research suggests that both mothers and their children often experience negative outcomes following unplanned pregnancies. Unplanned pregnancy is associated with maternal depression in pregnancy (Maxson & Miranda, 2011; Messer, Dole, Kaufman, & Savitzl, 2005), postpartum depression (Miller, Sable, & Beckmeyer, 2009; Nelson & O'Brien, 2012), and parenting impairments (East, Chien, & Barber, 2012; Miller et al., 2009). Children born of unplanned pregnancies tend to demonstrate developmental delays at five years old (Crissey, 2005), and mental health and behavioral problems as adolescents (Hayatbakhsh et al., 2011) and young adults (Axinn, Barber, & Thorton, 1998; Kubicka, Roth, Dytrych, Matejcek, & David, 2002).

However, there are many limitations to the existing literature which this study aimed to address. Previous research examining child outcomes associated with unplanned pregnancy has relied on data from several decades ago which may not be generalizable to present day. For example, from the handful of studies that have examined child outcomes, one study examined a

23 year follow-up of pregnancy intention reports from a study conducted in Detroit in 1961 (Axinn et al., 1998) and another used data from the Prague Study which assessed pregnancy intention in 1972 in the Czech Republic (Kubicka et al., 2002). Further, many studies examining outcomes associated with unplanned pregnancy have not included participants who are most at risk of experiencing unplanned pregnancies. Unplanned pregnancies are most common among women who are young (Kissen, Anderson, Kraft, Warner, & Jamieson, 2008; Maxson & Miranda, 2011; Postlethwaite, Armstrong, Hung, & Shaber, 2010), unmarried (Maxson & Miranda, 2011; Mosher, Jones, & Abma, 2012; Musick, 2002; Postlethwaite et al., 2010), socioeconomically disadvantaged (Maxson & Miranda, 2011; Mosher et al., 2012; Postlethwaite et al., 2010), and identify as racial or ethnic minorities (Maxson & Miranda, 2011; Mosher et al., 2012; Postlethwaite et al., 2010; Bryant, Nakagawa, Gregorich, & Kupperman, 2010). However, many studies in this area have used large datasets with primarily White, married, and educated participants (e.g., Miller et al., 2009; Su, 2012). There is a need for examination of these associations among a diverse sample of women who are most at-risk of experiencing unplanned pregnancies. This current study examined child behavioral outcomes associated with unplanned pregnancy among a diverse sample of first time mothers recruited as part of the *Predicting and Preventing Neglect in Teen Mothers* study.

Previous research examining unplanned pregnancy has also been limited in its measurement of pregnancy intention as most studies ask participants to report their intentions at or after the birth of their children. This is problematic because reports are subject to recall bias, social desirability bias, and "postbirth rationalization" (East et al., 2012, p. 169). Parents may be less likely to report that their pregnancy was unplanned or unwanted because of social stigma, and this bias may be particularly salient once parents have formed attachments with their

children. Therefore, assessment of pregnancy intention at or after birth may result in an underreporting of unplanned pregnancies. Conversely, many mothers experience temporary depressive symptoms shortly following their child's birth (O'Keane et al., 2011), which could result in an overreporting of pregnancies as unplanned or unwanted. Either way, it is ideal to assess pregnancy intention prior to the child's birth to avoid bias (Kavanaugh & Schwarz, 2009). To address this limitation, the current study used reports of mothers' pregnancy intention which were collected during their third trimester of pregnancy.

Finally, few studies have examined mechanisms through which unplanned pregnancy is associated with maternal and child outcomes. Relatedly, the majority of previous research has not been informed by theory. Incorporating theory could help to organize and make sense of the current mixed findings in the literature and suggest potential mediators. This current study was guided by Family Systems Theory which suggests that each subsystem in a family system influences and is influenced by the other family members and subsystems (Cox & Paley, 1997; Minuchin, 1985). Therefore, from a Family Systems Theory perspective, child outcomes associated with unplanned pregnancy are influenced by other family members as well as other subsystems in the family. This current study examined maternal factors including depressive symptoms and parenting stress and the parental subsystem factor of coparenting satisfaction as potential mediators of the association between unplanned pregnancy and negative child outcomes.

1.1 Study Aims

To address many of the limitations of the extant literature and to better understand the outcomes associated with unplanned pregnancy, this study had three aims. First, this study aimed to determine whether pregnancy intention was associated with maternal depressive symptoms,

maternal parenting stress, and maternal satisfaction with coparenting at 24 months, and child behavioral outcomes at 36 months. The second aim was to determine mechanisms through which pregnancy intention was associated with child outcomes; specifically maternal depressive symptoms, parenting stress, and coparenting satisfaction were examined as mediators of the association between unplanned pregnancy and negative child behavioral outcomes. Third, this study examined the reciprocal associations among depressive symptoms, parenting stress, and coparenting satisfaction over time, and sought to unravel the pathways through which unplanned pregnancy was associated with child behavioral outcomes.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Introduction

Around half of all pregnancies in the U.S. and worldwide are unplanned (Finer & Kost, 2011; Singh et al., 2010). Research suggests that there are often negative outcomes for both mothers and their children following unplanned pregnancies (Axinn et al., 1998; Crissey, 2005; East et al., 2012; Hayatbakhsh et al., 2011; Miller et al., 2009; Nelson & O'Brien, 2012). However, existing research has not examined mechanisms through which unplanned pregnancy is associated with negative outcomes. Discovery of mechanisms in this association will provide practitioners with intervention points for work with families experiencing unplanned pregnancies.

2.2 Theoretical Framework

Most of the existing pregnancy intention research has not been guided by theory which consequently has limited its ability to hypothesize mechanisms. Two studies (Maximova & Quesnel-Vallee, 2009; Su, 2012) were exceptions as they each used a Life Course perspective to explain the negative individual mental health outcomes associated with unplanned pregnancies. However, only Su (2012) hypothesized mechanisms in the association and in both cases the theory was not fully supported by the data. Maximova and Quesnel-Vallee (2009) examined the association between pregnancy intention and depressive symptoms among men and women in their early and late thirties. Based on Life Course Theory, they hypothesized that those experiencing an unplanned pregnancy later in life would experience more depression because the event would be more "off time." However, they found that unplanned pregnancy was only associated with depression among men in their early thirties, which was inconsistent with their

hypothesis. Su (2012) also examined the association between pregnancy intention and depressive symptoms. Informed by Life Course Theory, she hypothesized that the experience of a mistimed transition to parenthood would be associated with lower social support, more financial strain, and lower self-efficacy because of the lack of time to prepare for the transition. Therefore, she tested social support, financial strain, and self-efficacy as mediators of the association between unplanned pregnancy and depression. Her hypotheses were partially supported in that among men, unplanned pregnancy was directly associated with more depression, and the association was mediated by financial strain. Among women, unplanned pregnancy was directly associated with lower life happiness, but not depression, and the association was mediated by self-efficacy. Taken together, these findings are partially consistent with a Life Course perspective. However, both of these studies examined individual parental outcomes, and Life Course Theory is less able to explain the negative child or relational outcomes associated with unplanned pregnancies. To address these limitations, this current study was guided by Family Systems Theory.

Family Systems Theory grew out of Ludwig von Bertalanffy's (1950) assertions that in order to understand organized wholes, the components of the whole and the relations between those components must be understood. His ideas about systems in general were applied to family functioning such that one family member or subsystem cannot be fully understood without examining the larger family context (Minuchin, 1985). Family Systems Theory asserts that families are complex, integrated wholes where family members are interdependent and continuously influence one another (Minuchin, 1988). Subsystems within the family, or smaller groups of family members such as parents or children, have the potential to influence and be influenced by the other subsystems (Bowen, 1966; Cox & Paley, 1997; Minuchin, 1985). Patterns of interaction and adjustment in one generation are often repeated in future generations

(Boszormeny-Nagy & Ulrich, 1981; Bowen, 1966); therefore, in order to understand individual child development, family dynamics and development also need to be understood (Allison & Sabatelli, 1988).

Therefore, Family Systems Theory suggests that child outcomes are not only the result of individual child characteristics but also of processes and interactions within and between family subsystems (Cox & Paley, 1997). Extant research specific to unplanned pregnancy suggests several parental subsystem factors which may help explain the association between unplanned pregnancy and negative child outcomes. For example, previous research has suggested links between unplanned pregnancy and maternal depressive symptoms (Miller et al., 2009; Nelson & O'Brien, 2012), parenting stress (East et al., 2012; Miller et al., 2009), and couple coparenting issues (Claridge & Chaviano, 2014). It is possible that these parental subsystem factors associated with unplanned pregnancy are mechanisms in the association between unplanned pregnancy and child outcomes. Therefore, this current study examined maternal individual characteristics, including depressive symptoms and parenting stress; as well as coparenting satisfaction, a parental subsystem characteristic, as potential mediators in the association between pregnancy intention and child outcomes over time.

Additionally, Family Systems Theory asserts that causal pathways are circular or reciprocal rather than linear (Watzlawick, Bavelas, & Jackson, 1967). Causality is hard to determine because individual and subsystem characteristics mutually influence each other through circular causality. Therefore, this study also examined the reciprocal associations among maternal depressive symptoms, parenting stress, and coparenting satisfaction over time, and whether the reciprocal relations were mechanisms through which unplanned pregnancy was associated with child behavioral outcomes. A conceptual model is presented in Figure 1.

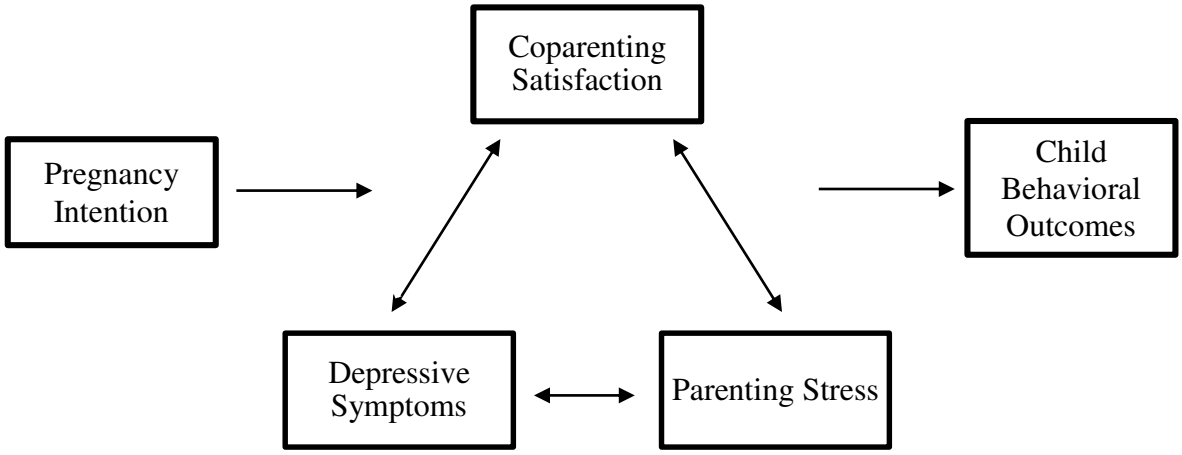

Figure 1.
Conceptual model illustrating associations among pregnancy intention, depressive symptoms, parenting stress, coparenting satisfaction, and child outcomes over time.

2.3 Pregnancy Intention

Unplanned pregnancy is prevalent in the U.S. (Finer & Kost, 2011) and worldwide (Singh et al., 2010). Research over the past two decades has highlighted the negative maternal (East et al., 2012; Miller et al., 2009; Nelson & O'Brien, 2012) and child outcomes (Axinn et al., 1998; Crissey, 2005; Hayatbakhsh et al., 2011) associated with unplanned pregnancies. In 2008, Gipson, Koenig, and Hindin synthesized the literature and highlighted maternal outcomes such as depression, anxiety, and parenting impairments and child outcomes such as low birth weight and impaired development which are associated with unplanned pregnancy. Ultimately, Gipson et al. concluded that findings were limited by the small number of studies that examined these associations, by the fact that few studies were guided by theory, and because of measurement issues related to capturing pregnancy intention. Existing research has seldom examined mechanisms through which unplanned pregnancy is associated with negative outcomes. This is unfortunate as understanding of mechanisms could inform intervention with families

experiencing unplanned pregnancies, and may help to prevent negative outcomes among at-risk children.

2.3.1 Unplanned Pregnancy and Maternal Depressive Symptoms

Gipson and colleagues (2008) highlighted the link between unplanned pregnancy and maternal depressive symptoms. Several recent studies have further supported the association between unplanned pregnancy and maternal depressive symptoms both in pregnancy (Maxson & Miranda, 2011; Messer et al., 2005) and postpartum (Miller et al., 2009; Nelson & O'Brien, 2012). Messer and colleagues (2005) found that among a sample of mainly White, educated women in North Carolina, unplanned pregnancy was associated with more depression and lower self-efficacy in pregnancy. Maxson and Miranda (2011) found that among a sample of mainly Black, low-income women in North Carolina, unplanned pregnancy was associated with more depression and stress, and less social support and self-efficacy in pregnancy.

Other studies have examined the association between unplanned pregnancy and postpartum depression. East and colleagues (2012) used a cross-lagged model to examine pregnancy intention over time among a sample of 100 Mexican-American adolescents ages 15-19. They found that low pregnancy wantedness and regret during pregnancy were concurrently associated with more depressive symptoms in pregnancy. However, they were not associated with later depressive symptoms at 6 or 12 months postpartum. Instead, depression in pregnancy predicted maternal self-reports of lower pregnancy wantedness at 6 and 12 months postpartum. Conversely, Miller et al. (2009) found that unplanned pregnancy reported at one month postpartum was associated with more depressive symptoms at six months postpartum among a large sample of primarily socioeconomically advantaged participants. Similarly, Nelson and

O'Brien (2012) found that among first time mothers unplanned pregnancy reported at nine months postpartum was associated with more depressive symptoms at three years after the birth.

However, two recent studies did not find an association between unplanned pregnancy and maternal depressive symptoms (Maximova & Quesnel-Vallee, 2009; Su, 2012). Both studies were limited because participants were primarily in their thirties, White, married, and of middle to high socioeconomic status (SES), and thus, did not represent populations that commonly experience unplanned pregnancies (Bryant et al., 2010; Kissen et al., 2008; Maxson & Miranda, 2011; Postlethwaite et al., 2010). Taken together, the findings suggest that there is an association between unplanned pregnancy and depressive symptoms in pregnancy and postpartum. However, the findings are inconsistent across studies indicating that there may be mediators or moderators of the association that should be further studied.

2.3.2 Unplanned Pregnancy and Maternal Parenting Stress

Given the emerging link between unplanned pregnancy and maternal depressive symptoms, and the link between maternal depressive symptoms and parenting impairments (e.g., Austin & Priest, 2005; Burke, 2003), researchers have begun to examine the association between unplanned pregnancy and maternal parenting outcomes. Among a small homogenous sample, East and colleagues (2012) found that low pregnancy wantedness and high regret in pregnancy were associated with participant reports of harsher parenting behavior and more parenting stress at both 6 and 12 months postpartum. They also found a reciprocal relationship between pregnancy regret and parenting stress: Regret in pregnancy was associated with report of more parenting stress at six months postpartum, which was in turn, associated with more pregnancy regret at one year postpartum. Claridge and Chaviano (2013) also found that mothers who reported unplanned pregnancies were more likely to report parenting stress when their children

were one year old. Moderation analyses indicated that the association was more salient among mothers who were using substances during pregnancy or who had completed less education. Finally, Miller and colleagues (2009) found a link between unplanned pregnancy and more parenting stress at 6 months postpartum, poor parent-child interactions at 15 months, and insecure child attachment at 24 months. They also found that parenting stress partially mediated the association between unplanned pregnancy and child attachment at 24 months.

A comprehensive review of the literature indicates that unplanned pregnancy may be associated with more parenting stress and parenting practice impairments; however, there are still only a small number of studies which have examined these outcomes. Given the finding that parenting stress partially mediated the association between unplanned pregnancy and insecure child attachment, it is possible that parenting stress may serve as a mechanism through which unplanned pregnancy is associated with other child outcomes over time.

2.3.3 Unplanned Pregnancy and Coparenting

Few studies have examined relational outcomes associated with unplanned pregnancy. Unplanned pregnancies are more common among mothers who are unmarried (Kost & Forrest, 1995; Musick, 2002). Unmarried births, in turn, are associated with higher risk of relationship dissolution (Carlson, McLanahan, & England, 2004). Therefore, when studying relational outcomes, it may not be relevant to assess parents' relationship satisfaction. Rather, it may be more appropriate to assess a construct such as coparenting, which represents parents' relationships specifically related to their parenting roles (Feinberg, 2003). Few studies have examined the association between pregnancy intention and coparenting satisfaction. One recent study found that unplanned pregnancy was associated with both mothers' and fathers' reports of less satisfying coparenting when children were three, five, and nine years old, even after

controlling for parental age, educational attainment, marital status, and race (Claridge & Chaviano, 2014). Another study found that mothers' reports of coparenting satisfaction served as a mediator in the association between pregnancy intention and children's behavioral outcomes at age five (Claridge, Scott, & Chaviano, under review). Specifically, the study found that mothers who reported unplanned pregnancies at the birth of their children tended to report many child behavioral issues at age five. However, when mothers perceived supportive coparenting with their children's biological fathers at age three, they were likely to report fewer child behavioral issues regardless of pregnancy intention. Taken together, the studies provide initial evidence for the association between pregnancy intention and coparenting and suggest that coparenting may be a protective mechanism in the association between pregnancy intention and children's outcomes.

2.3.4 Unplanned Pregnancy and Child Behavioral Outcomes

Gipson and colleagues (2008) highlighted mixed findings related to the association between unplanned pregnancy and negative child behavioral outcomes. Several studies have examined outcomes of children and adolescents following unplanned pregnancies; however, only two studies have examined early childhood outcomes associated with unplanned pregnancy. Claridge et al. (under review) found that unplanned pregnancies were associated with mother report of more total behavior problems among five year old children. Further, Crissey (2005) examined child outcomes, including physical health, activity level, and cognitive, social, and language development among four and five year olds. Results indicated that unplanned pregnancy was associated with mother report of poor physical health, undesirable activity level, and poor developmental outcomes among their four and five year olds. However, this study was limited because data were collected between 1988 and 1992, and pregnancy intention was

measured retrospectively when the focal children were 16-18 months old. Both studies were limited by their use of mother reports of children's outcomes.

Other studies have examined outcomes among adolescents and young adults. Hayatbakhsh and colleagues (2011) examined the association between mother-reported pregnancy intention and later adolescent reports of their behaviors and mental health. Adolescents whose mothers reported unplanned pregnancies reported more aggression; depression; anxiety; substance use; and externalizing, internalizing and total behavior problems than those whose mothers reported planned pregnancies. After controlling for maternal characteristics including mothers' age, education, depression, anxiety, and substance use in pregnancy; unplanned pregnancy was still associated with adolescent reports of more aggression, substance use, and total problem behaviors.

Axinn et al. (1998) examined a 23 year follow-up of a study originally conducted in Detroit in 1961. They found that the young adult children born of unplanned pregnancies reported lower self-esteem and less educational attainment. Kubicka et al. (2002) conducted 31- and 35-year follow-ups to the Prague Study conducted in the Czech Republic in 1972. The original participants were mothers who had attempted to terminate their pregnancies, but had been denied two times for the same pregnancy. These women's pregnancies were categorized as "unwanted." The original study also included a demographically matched sample of women with "accepted" pregnancies. Results indicated that the adult children of unwanted pregnancies reported more depression and anxiety and were more likely to report a history of severe mental illness compared to the adult children of accepted pregnancies. Further, the study recruited siblings of both accepted and unwanted children and found that even within families, the children of unwanted pregnancies reported more mental health issues than their siblings whereas

siblings and focal children of accepted pregnancies tended to report similar levels of mental health issues.

In sum, existing studies indicate that there may be both immediate and long-term negative outcomes for children born of unplanned pregnancies. However, there are still few studies examining the association and the existing studies have many limitations. Many studies in this area used data which were decades old and may not generalize to present day. There is a need to replicate these studies with more recent data and to examine mechanisms through which unplanned pregnancy is associated with child outcomes in order to better understand the phenomenon and inform intervention with this population.

2.3.5 Prevalence and Demographic Trends

Examination of the outcomes associated with unplanned pregnancy is important given the prevalence of unplanned pregnancy and the fact that unplanned pregnancies are more common among mothers who are disadvantaged in terms of race, age, education, income, and relationship status. In 2008, approximately 41% of pregnancies worldwide were unplanned compared to around 48% of pregnancies in the U.S. (Singh et al., 2010). Of those unplanned pregnancies, a plurality (48%) resulted in live births whereas 38% ended in surgical abortions, and 14% ended in miscarriages. Although worldwide unplanned pregnancy rates, even in developing countries, decreased by 20% between 1995 and 2008, rates in the U.S. have remained stable over the same time period.

Using data from the Centers for Disease Control and Prevention (CDC) from 2006, Finer and Kost (2011) examined state levels of unplanned pregnancy in the U.S. They found that the median rate of unplanned pregnancy across states was 53%, with 29 states demonstrating rates over 50%, and the remaining states' rates between 38-50%. Between 2002 and 2006, rates

increased or remained stable in almost all states. A follow-up study indicated that rates of unplanned pregnancy were highest among states with large proportions of young women (18-24), Black and Hispanic women, and unmarried women (Kost et al., 2012).

Several other studies have examined individual level characteristics of women who tend to experience unplanned pregnancies. Unplanned pregnancies are more prevalent among women who are young (Kissen et al., 2008; Maxson & Miranda, 2011; Postlethwaite et al., 2010), unmarried (Maxson & Miranda, 2011; Mosher et al., 2012; Musick, 2002; Postlethwaite et al., 2010), report low education (Maxson & Miranda, 2011; Mosher et al., 2012; Postlethwaite et al., 2010), low income (Maxson & Miranda, 2011; Mosher et al., 2012) and who are not White (Maxson & Miranda, 2011; Mosher et al., 2012; Postlethwaite et al., 2010; Bryant et al., 2010). Additionally, Musick (2002) found that women who reported growing up in a single-parent household or who were cohabitating with their partner at the time of conception were more likely to report unplanned pregnancies. As a whole, the state- and individual-level findings suggest that unplanned pregnancies are more common among women who are socioeconomically disadvantaged.

2.3.6 Mechanisms in the Association between Unplanned Pregnancy and Maternal and Child Outcomes

Given the evidence that unplanned pregnancies are often associated with maternal depressive symptoms, parenting stress, and coparenting, and Family Systems Theory assertions that family members are interconnected and impact each other's outcomes, it is possible that these parent-level factors are mechanisms through which unplanned pregnancy is associated with child outcomes, including externalizing, internalizing, dysregulation, and social-emotional

competence. Existing research examining associations between child outcomes and maternal depression, parenting stress, and coparenting also supports this hypothesis.

2.3.6.1 Depressive symptoms, parenting stress, and child outcomes. Extant research highlights a link between maternal depressive symptoms in pregnancy or postpartum and difficulty in emotional interaction (Austin & Priest, 2005) and formation of insecure attachment bonds with their infants (Moehler, Bruner, Wibel, Reck, & Resch, 2006). In turn, infants of depressed mothers are more likely to demonstrate delays in cognitive, behavioral, socio-emotional, and motor development (Kingston, Tough, & Whitfield, 2012). Over time, maternal depression is associated with higher rates of child externalizing behaviors, such as aggression, delinquency, and hyperactivity (Allen, Manning, & Meyer 2010; Korhonen, Luoma, Salmelin, & Tamminen, 2012; Lizardi, Klein, & Shankman, 2004; Munson, McMahon, & Spieker, 2001), and internalizing symptoms, including depression and anxiety (Brennan, Hammen, Katz, & Le Brocque, 2002; Burke, 2003; Lizardi et al., 2004).

Parenting stress commonly co-occurs with maternal depression (Farmer & Lee, 2011; Gelfand, Teti, & Fox, 1992; Milgrom & McCloud, 1996; Spinelli, Poehlmann, & Bolt, 2013). Like depression, parenting stress is associated with parenting practice impairments (Belsky, 1984; Crawford & Manassis, 2001; Farmer & Lee, 2011; Xu et al., 2005), as well as negative child mental health and behavioral outcomes (Anthony et al., 2005; Baker et al., 2003; Crnic, Gaze, & Hoffman, 2005). Specifically, parenting stress has been found to be associated with more total behavior problems (Baker et al., 2003; Crnic et al., 2005) and more externalizing and internalizing behaviors and lower social competence among preschoolers (Anthony et al., 2005).

Given these findings, which are consistent with the Family Systems Theory assertion that parental characteristics and behaviors impact children's behaviors, and existing research which

links unplanned pregnancy and maternal depression in pregnancy (East et al., 2012; Messer et al., 2005; Maxson & Miranda, 2011) and depression (Miller et al., 2009; Nelson & O'Brien, 2012) and parenting stress (East et al., 2012; Miller et al., 2009) in the postpartum, it is possible that maternal depressive symptoms and parenting stress are mechanisms through which unplanned pregnancy is associated with child behavioral outcomes. Thus, this current study aimed to test these associations.

2.3.6.2 Coparenting and child outcomes. Another important predictor of child outcomes is the coparenting relationship between children's biological parents. Coparenting is defined as the ways in which parents relate to each other and to the child in the role of a parent (Feinberg, 2003, p. 96). The concept of coparenting distinguishes the parenting roles from other relationship roles, and remains even when other aspects of parents' relationships dissolve. Existing literature highlights the positive impact of coparenting on child mental health and behavior outcomes. Specifically, supportive coparenting is associated with higher self-esteem (Camara & Resnick, 1989), and fewer externalizing (McHale & Rasmussen, 1998; Smith-Simon, 2007) and internalizing (McHale & Rasmussen, 1998; Shaw, Keenan, Vondra, Delliquandri, & Giovannelli, 1997; Smith-Simon, 2007) behaviors among children. Supportive coparenting is also associated with more father involvement (Carlson, McLanahan, & Brooks-Gunn, 2008; Waller, 2012) which is another predictor of positive child outcomes (Garfield & Isacco, 2012; Pancsofar & Vernon-Feagans, 2006).

Although previous research specific to unplanned pregnancy and relational outcomes is limited, the concept of supportive coparenting may be particularly important among families experiencing unplanned pregnancy. As previously stated, unplanned pregnancy is more common among unmarried parents (Kost & Forrest, 1995; Musick, 2002) whose romantic relationships

may be at a higher risk of dissolution (Carlson et al., 2004). Family Systems Theory asserts that each subsystem of the family influences the other subsystems; therefore, it is important to assess the parental relationship in addition to individual parental characteristics when examining child outcomes. Among this population, however, assessment of the parental coparenting relationship may be more relevant than assessment of romantic relationship satisfaction. Therefore, this current study examined coparenting satisfaction as a potential mechanism through which unplanned pregnancy was associated with child behavioral outcomes.

2.3.6.3 Associations among depressive symptoms, parenting stress, and coparenting. Existing research suggests that depressive symptoms, parenting stress, and relational factors such as coparenting are interrelated. However, the direction of associations is not yet clear. For example, previous literature suggests that maternal depressive symptoms and relationship issues are associated (Carter, Grigoriadis, Ravitz, & Ross, 2010; Davey, Dziurawiec, & O'Brien-Malone, 2006; Davila, Karney, Hall & Bradbury, 2003; Proulx, Helms, & Buehler 2007; Whitton, Stanley, Markman, & Baucom 2008; Whisman & Uebelacker, 2006). On one hand, it is presumed that relationship problems influence the etiology and maintenance of depressive symptoms (Joiner, 2000; Whisman & Bruce, 1999). An alternative hypothesis according to the stress generation model (Hammen, 2006) is that maternal depression may negatively impact relationship satisfaction because of the mothers' role impairment (Kessler et al., 2003) and difficulty providing support to her partner (Davila, Bradbury, Cohan, & Tochluk, 1997), which are related to subsequent negative relationship interactions (Joiner, 2000). However, existing research has not been able to clarify the direction of causality in this association, and according to Family Systems Theory, maternal depression and relationship issues may be interconnected and reciprocally related rather than linearly associated.

The same is true regarding parenting stress as there is evidence that relationship conflict is associated with more parenting stress (Webster-Stratton, 1989) and more parenting stress is associated with lower relationship quality (Lavee, Sharlin, & Katz, 1996). Further, there is evidence that parenting stress and depressive symptoms are interrelated (Farmer & Lee, 2011; Spinelli et al., 2013), but it is not clear whether parenting stress contributes to maternal depressive symptoms or vice versa. Using cross-lagged modeling, this study aimed to parcel out directions of associations by examining the reciprocal associations among depressive symptoms, parenting stress, and coparenting satisfaction over time.

2.4 Limitations of Existing Literature

Despite the recent advances in the literature on pregnancy intention, there are several limitations which still need to be addressed in future studies, including limitations in participants, measurement, and use of theory.

2.4.1 Participants

A significant limitation is related to the participants who have been included in existing unplanned pregnancy studies. Samples tend to be either small, and sometimes include at-risk participants, or large, but include primarily advantaged participants. For example, Maxson and Miranda (2011) included a sample of 1,321 primarily Black and low income participants who were all from North Carolina. Similarly, East and colleagues (2012) included a sample of only 100 Mexican-American adolescents from California. In both cases, the inclusion of at-risk participants was helpful, but the samples were homogenous and lacked generalizability. Conversely, Su (2012), Maximova and Valle-Quesnel (2009), and Miller et al. (2009) all used large datasets, but included participants who were primarily White, married, high income, and high education. There is a need for diverse samples to improve the generalizability of the

findings in this area, especially given the higher prevalence of unplanned pregnancy among disadvantaged groups (e.g., Bryant et al., 2010; Kissen et al., 2008; Kost & Forrest, 1995; Musick, 2002). The current study assessed pregnancy intention among first time mothers who were diverse in terms of age, educational status, relationship status, and race.

2.4.2 Measurement

Another limitation is related to measurement of pregnancy intention. Many of the existing findings are based on retrospective assessments of pregnancy intention. Specifically, most studies ask participants about their pregnancy intention at or after the birth of their children. This requires participants to recall their intention at the time of conception, and that recall may be biased. East and colleagues (2012) discuss the problems of social desirability bias which may influence recall of intention once parents decide to carry the pregnancy and very likely influence report of pregnancy intention once the child has been born due to social stigma associated with reporting a pregnancy as unplanned or unwanted. Another related issue is that of "postbirth rationalization" which occurs once parents have formed attachments with their children (East et al., 2012, p. 169). It is less likely that parents will report that a pregnancy was unplanned once an attachment begins to form. Therefore, participants may underreport unplanned pregnancy. Conversely, many mothers experience "maternity blues," temporary depressive symptoms in the postpartum period (O'Keane et al., 2011; Pitt, 1973), which may result in an overestimation of unplanned pregnancy when intention is assessed shortly after children are born. Either way, the common assessment of pregnancy intention at or after birth is problematic. Several researchers have called for assessment of pregnancy intention during pregnancy or prior to conception (Kavanaugh & Schwarz, 2009; Schwartz, Peacock, McRae, Seymour, & Gilliam, 2010). To

address this limitation, the current study assessed pregnancy intentions of first time mothers during their third trimester of pregnancy.

2.4.3 Theory

Finally, a significant limitation of the existing literature related is the lack of theoretical guidance. Most studies have not used theory to guide their designs or hypotheses, or to explain their findings. As reported earlier, the findings thus far are diverse and mixed, and the lack of a consistent theoretical framework makes it difficult to organize and understand the findings as a whole. Additionally, many studies have not examined mechanisms through which unplanned pregnancy is associated with negative maternal and child outcomes, and use of theory could highlight potential mechanisms. To address this limitation, this study was guided by Family Systems Theory, which suggests that maternal and parental subsystem factors may be mechanisms through which pregnancy intention is associated with child behavioral outcomes.

2.5 The Current Study

To address limitations in the literature, the present study had three aims. The first aim was to determine whether pregnancy intention was associated with maternal depressive symptoms, parenting stress, coparenting satisfaction, and child behavioral outcomes over the first three years. Given existing research suggesting that unplanned pregnancy is often associated with negative maternal and child outcomes (e.g., East et al., 2012; Miller et al., 2009), it was predicted that mothers who reported their pregnancies as unplanned would report more depressive symptoms and parenting stress, and less coparenting satisfaction when their children were 24 months old (H1). Further, reports of unplanned pregnancy were hypothesized to be associated with undesirable child behavioral outcomes at 36 months including high levels of

externalizing and internalizing behaviors, and dysregulation, and low levels of social-emotional competence (H1).

The second aim was to determine the mechanisms through which pregnancy intention was associated with child outcomes at 36 months old. Based on Family Systems Theory and extant literature, it was hypothesized that maternal depressive symptoms, parenting stress, and coparenting satisfaction at 24 months would mediate the association between unplanned pregnancy and negative child behavioral outcomes at 36 months (H2; Figure 2).

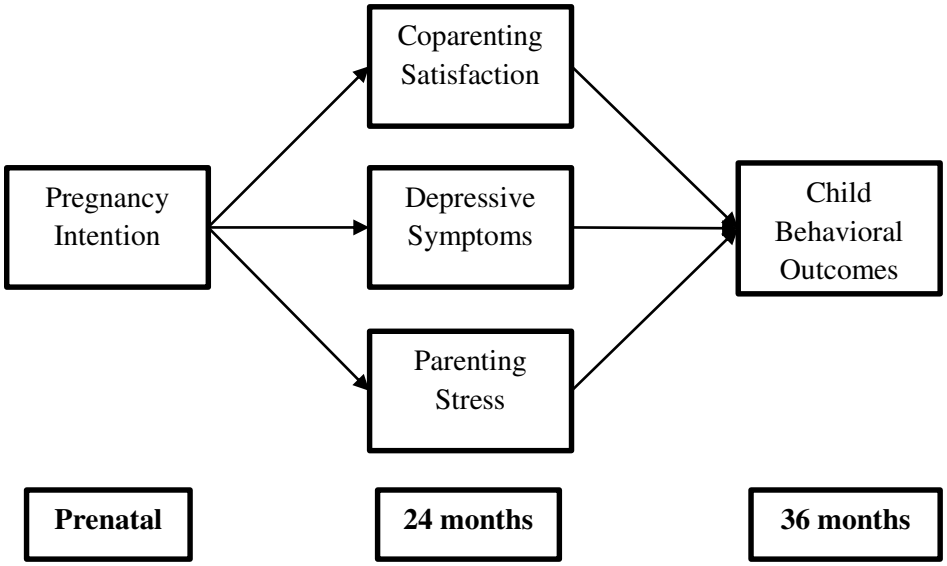

Figure 2.
Hypothesized mechanisms in the association between pregnancy intention and child behavioral outcomes over the first three years (H2).

Based on Family Systems Theory's assertion that there are reciprocal associations among family members and their behaviors (Minuchin, 1988), and existing research suggesting mutual influence among the study variables, the third aim was to determine whether there were reciprocal associations among depressive symptoms, parenting stress, and coparenting

satisfaction over time and whether the reciprocal associations mediated the association between pregnancy intention and child behavioral outcomes. As illustrated in Figure 4 (see Appendix A), it was hypothesized that unplanned pregnancy would be associated child behavioral outcomes through the reciprocal associations among maternal depressive symptoms, parenting stress, and coparenting satisfaction between the prenatal assessment and 36 months (H3). The cross-lagged model illustrates the predicted mutual influence among maternal depressive symptoms and parenting stress. Specifically, it was predicted that more depressive symptoms at 12 months would be associated with more parenting stress at 24 months which would, in turn, be associated with more depressive symptoms at 36 months. The reverse would also be true such that more parenting stress at 12 months will be associated with more depressive symptoms at 24 months which would be associated with more parenting stress at 36 months. Similarly, it was hypothesized that coparenting satisfaction would be reciprocally related to both maternal depressive symptoms and parenting stress over time. At each time point, more depressive symptoms and parenting stress were hypothesized to be associated with less satisfaction in coparenting over time and dissatisfaction in coparenting was hypothesized to be associated with more depressive symptoms and parenting stress at the following time point. The use of the cross-lagged model also allowed for identification of pathways through which unplanned pregnancy was associated with child outcomes over time.

CHAPTER THREE

METHOD

3.1 Participants and Procedures

This study used data collected between 2001 and 2007 as part of the multi-site *Predicting and Preventing Neglect in Teen Mothers* study which followed 682 first time mothers from their third trimester of pregnancy until their children were 36 months old (Borkowski et al., 2011). The study assessed maternal mental health, parenting behaviors and attitudes, and child behavioral and mental health outcomes.

3.1.1 Recruitment

Participants were recruited from medical and educational facilities in four U.S. cities: Birmingham, Alabama; Kansas City, Kansas; South Bend, Indiana; and Washington, DC. Three groups of mothers were recruited with a purposive oversampling of adolescents (n = 396), who were between 15 and 18 years old and had not completed high school at the time of recruitment. The study also included an educationally-diverse group of adults with low (n = 169) and high education (n = 117). Adults between the ages of 22 and 36 were categorized as "low education" if they had completed less than two years of college at the time of recruitment and "high education" if they had completed two or more years of college. In order to be eligible for the study, all mothers had to be pregnant with their first child; planned to keep the child; spoke English or Spanish; planned to live in the same area for the next three years; and did not report any impending incarceration, rehabilitation, or major physical or mental illness which would require absences from their child.

3.1.2 Data Collection

Investigators of the original study obtained Institutional Review Board (IRB) approval as well as informed consent from all participants prior to assessment. Mothers were interviewed during the last trimester of pregnancy as well as when their children were 4, 6, 8, 12, 18, 24, 30, and 36-months old. Prenatal interviews took place in person at medical clinics and later assessments either took place in participants' homes or in a laboratory setting. At 12, 24, and 36 month assessments children's physical, cognitive, and emotional development was assessed and at 4, 8, 18, and 30 month visits, assessors observed parent-child interactions in a home setting. At each assessment, participants completed self-report measures, interviews, and individual standardized testing.

3.1.3 Analytic Sample

To use the secondary data, the current investigator obtained verification of IRB exemption from Florida State University (HSC No. 2012.8355; see Appendix B). The current study included only mothers who completed child behavior assessments at 36-months (N = 224). Among the analytic sample, 51.8% (n = 116) were adolescents, 26.8% (n = 60) were adults who had completed less than two years of post-high school education, and 21.4% (n = 48) were adults with two or more years of college education. At the birth of their children, mothers ranged in age from 15 to 36 years old (M = 21.99, SD = 5.45). The plurality of mothers had not completed high school (42.3%; n = 95), 21.2% (n = 47) had completed only high school, 13.9% (n = 31) had completed some college, and 22.6% (n = 51) had completed college. Mothers primarily identified as Black (55.8%, n = 125), but were somewhat racially/ethnically diverse with 23.7% (n = 53) identifying as White and 17.8% (n = 40) identifying as Hispanic. Approximately half of the mothers were not in a relationship (54.1%; n = 121) during their third trimester of pregnancy,

23% (n = 52) were in a romantic relationship, and 22.1% (n = 50) were married. A large majority of mothers reported that their pregnancies were unplanned (76.3%; n = 171). Additional demographic characteristics of mothers and fathers are presented in Table 1 (see Appendix A).

3.1.4 Missing Data

The overall retention rate in the *Predicting and Preventing Neglect in Teen Mothers* study was 43.7% (n = 298) by the 36 month assessments. Of the mothers who completed the final assessments, only 224 (32.8% of the original sample) reported on their children's behavioral outcomes and were included in this current study. To understand the nature of the missing data, a series of comparisons of the full study sample, the subsample lost to follow-up, and the analytic sample were conducted. Analyses suggested that mothers in the analytic sample were significantly ($p < .05$) older than mothers who were lost to follow-up. Mothers in the analytic sample were also more likely to be in a relationship with the child's father during pregnancy and to be adults rather than adolescents. They also reported significantly more satisfaction with coparenting when their children were 24 months compared to mothers who were lost to follow-up. However, the subsamples were not significantly different in terms of maternal education or race, paternal education or race, pregnancy intention, or depressive symptoms or parenting stress at any waves of data collection.

Among the included participants, missing data were largely related to participants not completing all assessments at a specific wave of data collection. For example, mothers may have completed a measure at the 12 and 36 months assessments, but not at 24 months. Therefore, rather than deleting cases with missing data, all analyses used full information maximum likelihood (FIML) estimation to estimate model parameters. This method uses all available information to predict maximum likelihood estimations for the proposed model parameters, and

provides less biased estimates than other ad hoc procedures for handling missing data such as listwise and pairwise deletion, and mean substitution (Acock, 2005; Allison, 2003). To avoid biased scores, multi-item composite scores were not calculated in cases where data were missing on the item-level. Instead, total scores were coded as missing whenever an item in the scale was missing, and then estimated in analyses using FIML.

3.2 Measures

3.2.1 Pregnancy Intentions

Pregnancy intentions were measured using one item from the Borkowski Family and Maternal Life History (Borkowski et al., 2001). Mothers were asked one question ("Was this pregnancy planned or did it just happen?") about their pregnancy intentions at the prenatal assessment during their third trimester. Response options included "I planned to get pregnant with the baby's father" and "I planned to get pregnant around this time" which were recoded as "planned" (1) and "It just happened" which was recoded as "unplanned" (0).

3.2.2 Depressive Symptoms

Depressive symptoms were measured using the 21-item Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) which participants completed via self-report at every wave of data collection. The BDI-II assesses the severity of depressive symptoms including both cognitive-affective (e.g., sadness, loss of interest, and suicidal thoughts) and somatic-anxiety symptoms (e.g., fatigue, loss of interest, changes in sleep) within the last week. Each item required participants to choose from one of four options reflecting the severity of the depressive symptom ranging from 0-3. Two items were reverse coded and then all 21 items were added together to form a total depressive symptom scale with possible scores ranging from 0 to 63 and higher scores indicating more severe depression symptomology. Scores of 19 or above indicate

moderate depressive symptoms (Beck et al., 1996). Among the current analytic sample, the scale demonstrated strong internal consistency (Cronbach's α = .90 [12 months]; .91 [24 months]; .93 [36 months]). Previous studies have also demonstrated the test-retest reliability of the scale among college students (Beck et al., 1996; Sprinkle et al., 2002).

3.2.3 Parenting Stress

Parenting stress was assessed using the Parenting Stress Index- Short Form (PSI-SF; Abidin, 1995), a 36-item shortened version of Abidin's (1983) original 101-item assessment. The PSI-SF was completed by participants at 12, 24, and 36 month assessments. The total score represents mothers' stress specifically associated with parenting (e.g., "I feel trapped by my responsibilities as a parent" and "My child rarely does things for me that make me feel good"). For 33 of the items, participants responded on a five-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (5). Three questions were formatted slightly different: "I feel that I am:" with response options ranging from "not very good at being a parent" (1) to "a very good parent" (5); "I have found that getting my child to do something or stop doing something is:" with responses ranging from "much harder than I expected" (1) to "much easier than I expected" (5); and "Count the numbers of things which your child does that bother you" with responses ranging from "10+" (1) to "1-3" (5). Items were reverse scored as needed and added together to form a scale with higher scores representing more parenting stress. The scales at each time point demonstrated strong internal consistency (Cronbach's α = .92 [12 months]; .94 [24 months]; .93 [36 months]). Total stress scores ranged from 36 to 180, with scores of 90 or above indicating clinically significant parental stress (Abidin, 1995).

3.2.4 Coparenting Satisfaction

Maternal coparenting satisfaction was measured using seven items from the Borkowski Family and Maternal Life History (Borkowski et al., 2001). Mothers self-reported their satisfaction with their child's biological father in several areas. Specifically, items assessed satisfaction with financial support, other material support (i.e., gifts, food), help with childcare, visitations with the child, help with transportation, paternal family's help taking care of the child, and how father acts as a role model (e.g., "How satisfied are you with biological father's financial support?" and "How satisfied are you with how biological father acts as a role model?"). Responses were on a five-point scale ranging from "very dissatisfied" (1) to "very satisfied" (5). At each wave, responses were added together to form a scale (Chronbach's $\alpha = .91$ [12 months]; .92 [24 months]; .94 [36 months]) ranging from 7-35 with higher scores indicating more satisfaction with coparenting.

3.2.5 Child Behavioral Outcomes

Child behavioral outcomes were assessed using 124 items from the Infant-Toddler Social and Emotional Assessment- Revised (ITSEA; Carter & Briggs-Gowan, 2005). The ITSEA assesses parental perceptions of their 12-36 month old children's externalizing and internalizing behaviors, regulatory problems, and social-emotional competence. Previous studies have documented strong correlations between maternal reports on the ITSEA and observer ratings of child behaviors (Carter, Little, Briggs-Gowan, & Kogan, 1999; Carter, Briggs-Gowan, Jones, & Little, 2003) as well as strong correlations between ITSEA ratings and ratings on the well-established Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) which assesses older children's problem behaviors (Carter et al., 2003).

Mothers completed the ITSEA when their children were 36 months old. Each item contains a statement about the child's behavior and requires mothers to choose the response which best describes their child in the last month (e.g., "acts aggressive when frustrated," "seems nervous, tense or fearful," and "is affectionate with sibling(s)"). Response options for each item include "not true or rarely true" (0), "somewhat or sometimes true" (1), and "very true or often true" (2). The four core subscales were used in the present study: The *externalizing* subscale (24 items) assessed high activity, impulsivity, aggression and defiance; the *internalizing* subscale (30 items) assessed depression, social withdrawal, anxiety, separation distress, and extreme inhibition; the *dysregulation* subscale (34 items) assessed problems in sleeping and eating, emotional reactivity and regulation, and unusual sensory sensitivities; and the *social-emotional competence* subscale (36 items) assessed compliance, attention regulation, imitation and pretend play skills, mastery motivation, empathy, emotional awareness, and prosocial peer behaviors. Raw scores were converted to age-standardized t scores so that higher scores indicated more externalizing, more internalizing, more dysregulation, and more social-emotional competence, respectively. Each subscale demonstrated strong internal consistency (Chronbach's $\alpha = .88$ [externalizing]; .81 [internalizing]; .86 [dysregulation]; .92 [social-emotional competence]).

3.2.6 Covariates

Several common correlates of unplanned pregnancy, including parental relationship status, maternal age, education, and race, were examined in preliminary analyses as potential covariates to include in subsequent analyses. Mothers reported their relationship status with the child's father at the prenatal assessment during their third trimester of pregnancy. Responses were recoded into a dichotomous variable indicating whether mothers were in a relationship with the child's father (1; "married" or "in a relationship") or not (0; "separated," "divorced,"

"widowed," or "single"). Maternal age was calculated at the birth of the focal child using mother and child birth dates. Maternal race and education were reported by mothers at the prenatal assessment and both recoded into dummy variables. "White" was used as the race reference group in analyses. Education categories ranged from "less than high school" to "completed college," and "completed college" was used as the reference group in analyses.

3.3 Analytic Strategy

Preliminary analyses and descriptive statistics were conducted to determine the prevalence of unplanned pregnancy in the analytic sample, and to examine whether demographic characteristics varied by pregnancy intention. Maternal characteristics which were significantly different among participants with planned and unplanned pregnancies were included in subsequent analyses as covariates. Correlations were also computed to examine all associations among study variables at the various time points.

To address H1 that pregnancy intention would be associated with later maternal depressive symptoms, parenting stress, coparenting satisfaction, and child behavioral outcomes, a series of linear regressions were conducted using AMOS 20.0 (Arbuckle, 2006). Maternal depressive symptoms, parenting stress, and coparenting satisfaction at 24 months, and child externalizing, internalizing, dyregulation, and social-emotional competence at 36 months were each individually regressed on maternal pregnancy intention. An alpha level of .05 was used to assess significance of the associations.

To address H2 that maternal depressive symptoms, parenting stress, and coparenting satisfaction would be mechanisms through which unplanned pregnancy was associated with child behavioral outcomes, path analysis using guidelines for tests of mediation as recommended by Baron and Kenny (1986) was conducted using AMOS 20.0. When there was not a direct

association between pregnancy intention and a child behavioral outcome, mediators of that association were not examined. Model fit was assessed using guidelines provided by Kline (2005): Good model fit was indicated by a nonsignificant chi-square value, both a comparative fit index (CFI) and Tucker-Lewis Index (TLI) of 0.95 or higher, and a root mean square error of approximation (RMSEA) of less than 0.05.

Finally, to address H3 that pregnancy intention would be associated with child behavioral outcomes through the reciprocal associations among depressive symptoms, parenting stress, and coparenting satisfaction over time, the cross-lagged autoregressive model (Figure 4; see Appendix A) was tested in AMOS 20.0. This technique allowed for identification of reciprocal relations among depressive symptoms, parenting stress, and coparenting satisfaction over time to unravel the causal connections among the variables (Gershoff, Aber, & Clements, 2009) and tested the recursive associations between variables while simultaneously controlling for all other potential associations among the variables in the model (Martens & Haase, 2006). In order to achieve parsimony and determine the mechanisms in the association between pregnancy intention and child behavioral outcomes, associations not significant at 0.05 were removed from the final model. Model fit was evaluated using the same standards as outlined in H2.

3.3.1 Power

To ensure that the study included an adequate number of participants to accurately test the proposed models, a power analysis was conducted using G*Power 3.1.7 software (Faul, Erdfelder, Lang, & Buchner, 2007). Using the number of estimated parameters from the most complicated model (the cross-lagged H3 model; 97 parameters), an estimated multiple regression R^2 of .20, and a 0.05 significance level, the power analysis indicated that 231 participants were

required to achieve power of 0.80. Therefore, there was sufficient power to detect effects in H1 and H2, but the power in H3 would only be 0.77 according to the power analysis.

CHAPTER FOUR

STUDY RESULTS

4.1 Preliminary Analyses

4.1.1 Pregnancy Intention Group Differences

Chi-square tests and analyses of variance were conducted to examine whether demographic characteristics varied by pregnancy intention. As illustrated in Table 1 (see Appendix A), tests revealed that mothers who reported unplanned pregnancies were significantly younger than mothers who reported planned pregnancies [$F(1, 222) = 42.27$, $p < .001$], and were more likely to be adolescents than adults [$X^2(2) = 39.84$, $p < .001$]. Mothers with unplanned pregnancies also tended to have completed less education [$X^2(3) = 42.50$, $p < .001$] and were most likely to report their race as Black [$X^2(3) = 22.91$, $p < .01$]. The same pattern of results in terms of age, education, and race was evident among fathers. Unplanned pregnancies were more common among mothers who were single in their third trimester of pregnancy as opposed to in a relationship or married [$X^2(3) = 63.01$, $p < .001$]. Therefore, age, education, race, and relationship status were included as covariates in path analyses.

4.1.2 Bivariate Correlations

Next, correlations were computed to examine all associations among study variables at the various time points (Table 2; see Appendix A). Report of a planned pregnancy was significantly associated with fewer depressive symptoms at 12 months, less parenting stress at 24 months as well as more coparenting satisfaction when children were 12 and 24 months old. In terms of children's outcomes, planned pregnancies were associated with more social-emotional competence among 36 months olds. Parenting stress and coparenting satisfaction were significantly associated over time such that less parenting stress was associated with more

coparenting satisfaction. Similarly, depressive symptoms and parenting stress were positively associated. Although not consistent at every wave of data collection, more parenting stress and depressive symptoms tended to be associated with more externalizing and internalizing symptoms, more dysregulation, and less social-emotional competence at 36 months.

4.2 Hypothesis One: Pregnancy Intention and Child Outcomes

To test H1 that pregnancy intentions would be associated with maternal depressive symptoms, parenting stress, and coparenting satisfaction at 24 months and child behavioral outcomes at 36 months, a series of linear regressions were conducted. When children were 24 months old, experience of an unplanned pregnancy was associated with less coparenting satisfaction [β = .29, p < .001], and marginally associated with more parenting stress [β = -.19, p < .10]. Pregnancy intention was not associated with mothers' depressive symptoms at 24 months [β = -.04, p = .42]. In terms of children's outcomes at 36 months, unplanned pregnancy was associated with less social-emotional competence [β = .20, p < .01], but was not significantly associated with children's externalizing [β = -.06, p = .32] or internalizing [β = .01, p = .99] behaviors or dysregulation [β = .05, p = .48].

4.3 Hypothesis Two: Mechanisms in the Association between Pregnancy Intention and Child Outcomes

To examine H3 that maternal depressive symptoms, parenting stress, and coparenting satisfaction would be mechanisms through which unplanned pregnancy was associated with child behavioral outcomes, path analyses were conducted. Given the results from the previous linear regressions, pregnancy intention was only significantly associated (p < .05) with coparenting satisfaction at 24 months, and thus, only coparenting could be examined as a mediator of the association between pregnancy intention and children's social-emotional

competence at 36 months. However, the association between pregnancy intention and parenting stress was marginally significant ($p < .10$), and extant literature highlights the association between pregnancy intention and parenting stress (e.g., East et al., 2012) and the importance of parenting stress in predicting children's outcomes (e.g., Anthony et al., 2005), therefore, parenting stress was also examined as a mediator in this study.

First, the direct associations between the hypothesized mediators, coparenting satisfaction and parenting stress, and children's social-emotional competence were examined. Mothers' parenting stress at 24 months was significantly negatively associated [$\beta = -.39$, $p < .001$], and coparenting satisfaction was positively associated [$\beta = .28$, $p < .001$], with children's social-emotional competence at 36 months. Given the significant associations, the mediation model could be tested.

The addition of parenting stress and coparenting satisfaction as mechanisms reduced the direct association between pregnancy intention and children's social-emotional competence to nonsignificant [$\beta = .09$, $p = .18$]. All other paths were statistically significant (Figure 3), indicating that both parenting stress and coparenting satisfaction when children were 24 months served as mediators of the association between pregnancy intention and children's social-emotional competence at 36 months. To achieve parsimony, the nonsignificant direct path was removed from the final model, which demonstrated adequate fit [$X^2 = .183$, $df = 1$, $p = .18$; CFI = .98; TLI = .76; RMSEA = .06].

4.4 Hypothesis Three: Longitudinal Reciprocal Pathways through which Pregnancy Intention is Associated with Child Outcomes

A cross-lagged autoregressive model was constructed to test H3 that pregnancy intention would be associated with child behavioral outcomes through the reciprocal associations among

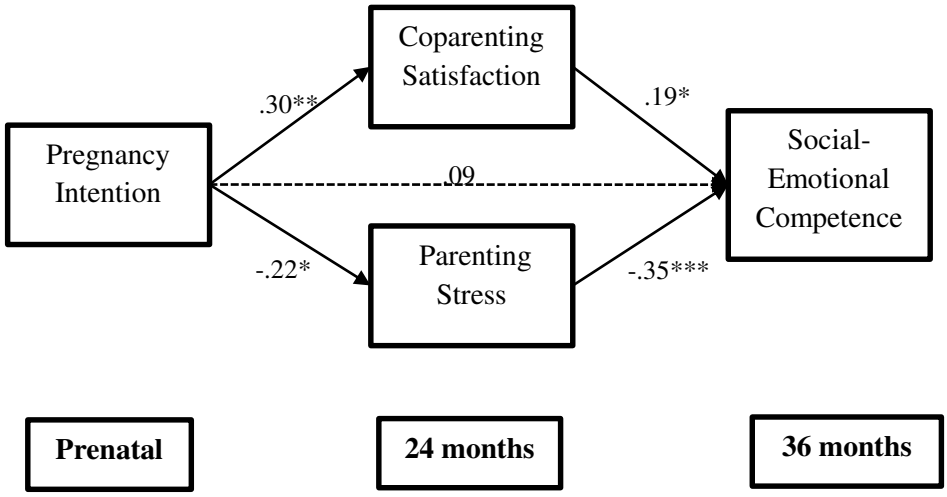

Figure 3.
Association between pregnancy intention and children's social-emotional competence at 36 months mediated by mothers' coparenting satisfaction and parenting stress at 24 months (H2).

Note. Standardized path coefficients are presented. Dashed lines represent effects that were not statistically significant and were eliminated from the final model.
* $p < .05$. ** $p < .01$. *** $p < .001$.

depressive symptoms, parenting stress, and coparenting satisfaction over time. Although simple linear regressions indicated that pregnancy intention was not directly associated with mothers' depressive symptoms at 24 months or children's externalizing, internalizing, and dysfunction at 36 months, these variables were still included in the cross-lagged model in order to test for indirect effects. All possible paths were included in the initial model to identify the multiple pathways through which pregnancy intention was associated with children's behavioral outcomes at 36 months. Maternal age, education, race, and relationship status were included as covariates.

The full model, including all direct associations and within-time error correlations, was saturated. Therefore, model fit could not be evaluated. To achieve parsimony and determine the specific pathways through which pregnancy intention was associated with child behavioral outcomes, associations not significant at $p < 0.05$ were removed from the final model. The final

model had a significant chi-square value [$X^2 = 101.56$, $df = 61$, $p < .01$] which is common in samples over 200 (Kenny, 2010). Otherwise, the model demonstrated good fit [CFI = .97; TLI = .94; RMSEA = .03].

Significant paths are illustrated in Figure 5 (see Appendix A), however, for ease of interpretation, standardized path coefficients are presented in Table 3 (see Appendix A). Prenatal report of an unplanned pregnancy was associated with more concurrent depressive symptoms as well as more depressive symptoms at 12 months postpartum. Unplanned pregnancy was also directly associated with more parenting stress and less coparenting satisfaction at 12 months. Maternal depressive symptoms during pregnancy and at 12 months were associated with more parenting stress at the subsequent waves of data collection. In turn, more parenting stress at 12 and 24 months was associated with less coparenting satisfaction at 24 and 36 months. Thus, maternal depressive symptoms tended to be associated with more parenting stress, which was then associated with less coparenting satisfaction over time. In terms of children's behavioral outcomes at 36 months, more coparenting satisfaction was concurrently associated with less dysregulation. Parenting stress at 36 months old was concurrently associated with more externalizing and internalizing behaviors, more dysregulation, and lower social-emotional competence among 36 year old children. Maternal depressive symptoms at 36 months were not associated with children's behavioral outcomes, however, prenatal depressive symptoms were directly associated with more externalizing behaviors, and depressive symptoms at 12 months were directly associated with less dysregulation when children were 36 months old.

4.5 Summary of Results

Overall, analyses suggested that report of an unplanned pregnancy was directly associated with lower social-emotional competence among 36 month old children. Further,

unplanned pregnancies were indirectly associated with more externalizing, internalizing, and dysregulation through maternal depressive symptoms, parenting stress, and coparenting satisfaction over time. Maternal depressive symptoms at one wave of assessments were consistently associated with more parenting stress at the following wave, which was associated with less satisfaction in coparenting at the next assessment. Both parenting stress and coparenting satisfaction at 36 months were directly associated with children's outcomes at 36 months. Therefore, results revealed multiple pathways through which unplanned pregnancy was associated with children's outcomes.

CHAPTER FIVE

DISCUSSION AND IMPLICATIONS

5.1 Discussion

The purpose of this study was to examine the association between mothers' pregnancy intentions and their children's behavioral outcomes at 36 months old and to explore mechanisms in the association that could be addressed in clinical intervention. Based on Family Systems Theory, maternal characteristics including depressive symptoms and parenting stress, and a parental subsystem characteristic, coparenting satisfaction, were examined as mechanisms in the association between pregnancy intention and children's behavioral outcomes. Further, reciprocal associations among maternal depressive symptoms, parenting stress, and coparenting satisfaction over time were examined as mechanisms through which pregnancy intention was associated with children's externalizing and internalizing symptoms, dysregulation, and social-emotional competence at three years old.

5.1.1 Prevalence of Unplanned Pregnancy

The prevalence of unplanned pregnancy among this sample (76.3%) was substantially higher than national averages (48-53%; Finer & Kost, 2011; Singh et al., 2010). This may be related to the demographic characteristics of this sample or to the measurement of pregnancy intention. A strength of this study was the inclusion of participants who were representative of the populations most likely to experience unplanned pregnancies. The current sample consisted of mothers who were primarily unmarried, had completed relatively little education, and primarily identified as minority races. Most of the participants were also adolescent mothers. Each of these characteristics is known to be associated with higher rates of unplanned pregnancies (e.g., Kissen et al., 2008; Maxson & Miranda, 2011; Postlethwaite et al., 2010),

therefore, this sample may have been particularly at-risk for unplanned pregnancy. The timing of the measurement of pregnancy intention may have also contributed to the high rate of reported unplanned pregnancies in this study. This study assessed mothers' pregnancy intention during their third trimester of pregnancy which is earlier than many previous studies which have assessed pregnancy intention retrospectively at the birth of the child or several months after the birth (e.g., Crissey, 2005; Miller et al., 2009). Reports made after the birth of the child may be biased due to "postbirth rationalization" or social desirability which both impact parents' recall of their intention at conception (East et al., 2012, p. 169). Therefore, estimates of unplanned pregnancy rates may be higher when assessed prior to parents forming attachments with their children. Future research should continue to assess pregnancy intention prospectively and during pregnancy to determine when it is most accurately assessed. Further, it is possible that the construct of pregnancy intention is not stable, but rather fluctuates over time, which should be further examined in future studies.

5.1.2 Pregnancy Intention and Child Outcomes

The first aim of the study was to test the association between pregnancy intention and children's externalizing and internalizing behaviors, dysregulation, and social-emotional competence at 36 months old. The results revealed that unplanned pregnancies were only directly associated with children's lower social-emotional competence. This finding is consistent with previous studies that found a connection between unplanned pregnancy and negative child developmental outcomes, including poor social skills at age five (Crissey, 2005). This association could be related to the fact that women who experience unplanned pregnancies often report less secure attachments with their infants (Miller et al., 2009), and secure attachment is important in the development of social skills and emotional competence (Calkins, 2004; Rispoli,

McGoey, Koziol, & Schreiber, 2013). However, the nonsignificant associations are surprising given Crissey's (2005) other findings that highlighted the link between unplanned pregnancy and children's undesirable activity levels and delayed motor and language development. Further, other studies have found a link between unplanned pregnancies and more externalizing and internalizing behaviors among adolescents (Hayatbakhsh et al., 2011) and lower self-esteem among young adults (Axinn et al., 1998). The lack of significant findings related to externalizing, internalizing, and dysregulation may be related to the age of the children in this study. This is the first known study to examine children's outcomes in the toddlerhood stage, so perhaps these associations emerge over time and are not present at three years old. This finding may suggest that there are other mechanisms in the association between unplanned pregnancy and children's outcomes in childhood and adolescence that have not yet played out and impacted children's outcomes at age three. Potential mechanisms were examined in later analyses in this study; however, future studies should continue to examine the association between unplanned pregnancy and children's outcomes over the course of their development.

5.1.3 Pregnancy Intention and Maternal Outcomes

The first aim also addressed the association between pregnancy intention and maternal depressive symptoms, parenting stress, and coparenting satisfaction at 24 months. Few previous studies had examined relational outcomes associated with unplanned pregnancy, but consistent with one previous study, results revealed that report of an unplanned pregnancy was associated with less satisfying coparenting when children were 24 months old (Claridge & Chaviano, 2014). Unplanned pregnancies were also marginally associated with more maternal parenting stress. Previous studies also highlighted positive correlations between unplanned pregnancy and

parenting stress (e.g., Claridge & Chaviano, 2013; East et al., 2012)which may be related to the experience of a mistimed transition and having less time to prepare for parenthood (Su, 2012).

However, contrary to hypotheses, unplanned pregnancy was not associated with maternal depressive symptoms at 24 months. Some existing studies have suggested that mothers who experience unplanned pregnancies are more likely to report postpartum depressive symptoms (e.g., Miller et al., 2009; Nelson & O'Brien, 2012). However, existing results have been mixed (e.g., Maximova & Quesnel-Vallee, 2009; Su, 2012). Future studies should continue to examine the conditions under which unplanned pregnancy is associated with depressive symptoms. Perhaps the examination of depressive symptoms at only 24 months did not capture the association between pregnancy intention and maternal depression.

5.1.4 Mechanisms in the Association between Pregnancy Intention and Child Outcomes

Mediation analyses indicated that both maternal parenting stress and coparenting satisfaction when children were 24 months old served as mechanisms in the association between unplanned pregnancy and children's social-emotional competence at 36 months old. Unplanned pregnancy was associated with more parenting stress and less coparenting satisfaction at 24 months, which were, in turn, associated with less social-emotional competence among 36 month old children. Even among mothers who reported unplanned pregnancies, when they also reported low parenting stress and high coparenting satisfaction at 24 months, they were more likely to report high social-emotional competence among their 36 month old children. This finding suggests that low parenting stress and high coparenting satisfaction may be protective mechanisms in the association between pregnancy intention and children's social-emotional competence. This finding is consistent with one existing study that found coparenting at age three served as a protective mechanism in the association between pregnancy intention and

children's total behavior problems at age five (Claridge et al., under review). However, this result expands on the literature by also highlighting the role of parenting stress and examining these mechanisms earlier in children's lives.

Surprisingly, maternal depression at 24 months old did not mediate the association between pregnancy intention and children's outcomes at 36 months old. As previously stated, many existing studies suggest that mothers who experience unplanned pregnancies are more likely to experience postpartum depressive symptoms (Miller et al., 2009; Nelson & O'Brien, 2012), and that maternal depression is associated with less secure child attachment (Moehler et al., 2006). Therefore, it is surprising that in this study unplanned pregnancy was not associated with maternal depression at 24 months, and maternal depression was not associated with children's social-emotional competence. The assessment of depressive symptoms at one point in time may not have captured maternal depressive symptoms over the first two years, and perhaps maternal depression is more saliently associated with pregnancy intention or children's outcomes at other times in the pregnancy or postpartum period. In fact, existing literature has suggested that the timing of maternal depression is important such that maternal depression when children are between two and five years old may be most strongly associated with children's later internalizing behaviors (Naicker, Wickham, & Colman, 2012). On the other hand, maternal depression in pregnancy or immediately postpartum tends to be associated with difficulties in attachment formation (Moehler et al., 2006) and may be most important in understanding children's outcomes. There is a need to further explore the timing of maternal depression and the pathways through which maternal depression is associated with children's outcomes.

5.1.4.1 Longitudinal reciprocal pathways. The final purpose of the study was to unravel the pathways through which pregnancy intention was associated with children's

behavioral outcomes by examining reciprocal associations among maternal depressive symptoms, parenting stress, and coparenting satisfaction over time. The results highlight the multiple pathways through which unplanned pregnancy is associated with children's behavioral outcomes. Interestingly, the importance of the timing of maternal depression was highlighted in the cross-lagged model. Mothers who reported unplanned pregnancies were more likely to report depressive symptoms during pregnancy. Maternal depressive symptoms were associated with more parenting stress at most subsequent waves of assessment (all except between 24 and 36 month assessments); and parenting stress, in turn, was associated with less coparenting satisfaction at each subsequent wave and poor child behavioral outcomes at 36 months. These findings suggest that early maternal depression, in pregnancy or the early postpartum period, was important in predicting later child outcomes. This is consistent with previous research highlighting the link between maternal depression in pregnancy and postpartum and negative child developmental outcomes (e.g., Kingston et al., 2012). This finding also expands on existing literature by illustrating the pathways through which maternal depression is associated with children's outcomes. Maternal depressive symptoms were indirectly associated with children's outcomes through mothers' parenting stress and coparenting satisfaction over the first 36 months. These indirect pathways are consistent with existing literature suggesting a link between depression and more parenting stress (e.g., Farmer & Lee, 2011; Spinelli et al., 2013) and depression and relationship issues (e.g., Carter et al., 2010).

Results from the cross-lagged model also highlighted the direct role of parenting stress in the association between unplanned pregnancy and all four child behavioral outcomes. Over time, when mothers reported high parenting stress at one wave of assessment, they were likely to report low coparenting satisfaction at the subsequent wave, which was in turn, associated with

child dysregulation at 36 months. Additionally, high parenting stress at 36 months was concurrently associated with many externalizing and internalizing behaviors and dysregulation, and low social-emotional competence among children. Perhaps mothers who experience unplanned pregnancies are less prepared to transition to parenthood, resulting in report of depressive symptoms and parenting stress. Mothers who are more stressed in their role as a parent tend to experience difficulty in parenting effectively (e.g., Farmer & Lee, 2011; Xu et al., 2005), which is associated with negative outcomes for children (e.g., Baker et al., 2003; Crnic et al., 2005). The findings in this study are consistent with previous research and further highlight the salience of maternal parenting stress in predicting children's outcomes across time.

One reciprocal association emerged such that maternal depressive symptoms at 12 months were associated with more parenting stress at 24 months, which was then associated with more depressive symptoms at 36 months. Consistent with the stress generation model (Hammen, 2006), depressive symptoms seem to be associated with more stress over time, which then exacerbates depressive symptoms (Jones, Beach, & Forehand, 2001). Contrary to hypotheses, there were not reciprocal associations among parenting stress and coparenting or depressive symptoms and coparenting. Instead, there was a clear direction of association such that depressive symptoms tended to be positively associated with later parenting stress, and parenting stress tended to be negatively associated with later coparenting satisfaction. Taken together, these findings may suggest that maternal depressive symptoms alone are not associated with poor developmental outcomes for children. Rather, consistent with a stress and coping perspective, when maternal depressive symptoms are paired with more parenting stress and less coparenting support to cope with the stress, they tend to be associated with child developmental issues (Wang & Dix, 2013). Conversely, in cases where maternal depressive symptoms are

paired with low stress or high support, mothers may be able to cope effectively, and children are less likely to experience negative outcomes.

5.2 Limitations

This study had several limitations. First, all variables were assessed by mother reports. This is problematic as mothers may have biased views of children's behaviors. In fact, mothers suffering from depression may overestimate their children's behavioral problems (Briggs-Gowan, Carter, & Schwab-Stone, 1996; Chi & Hinshaw, 2002). There may have also been issues of shared method variance because all measures were reported by mothers. Future research should include reports from fathers or other caregivers to avoid these biases.

There were other limitations related to measurement in this study. Pregnancy intention was assessed using one item during the third trimester of pregnancy. Previous studies have indicated that pregnancy intention may be better represented on a continuum rather than using a dichotomous measure (Kavanaugh & Schwarz, 2009). Therefore, future studies should measure the multiple dimensions of pregnancy intention, perhaps using the six-item London Measure of Unplanned Pregnancy (LMUP; Barrett, Smith, & Wellings, 2008) which assesses expressed intention, timing, desire for parenthood, partner influence, contraceptive use, and preparation for parenthood. Although the measurement of pregnancy intention during pregnancy was an improvement on previous studies that measured pregnancy intention postpartum, mothers often begin forming attachments to their children in pregnancy (Alhusen, 2008; Cranley, 1981), which may have still contributed to underreporting of unplanned pregnancies due to social desirability bias (East et al., 2012). Further, around 38% of unplanned pregnancies result in abortion, and assessment of pregnancy intention in the third trimester excludes those cases. The report of an unplanned pregnancy in the third trimester among women who all decided to carry the pregnancy

to term likely signifies some pregnancy wantedness. Thus, women who reported unplanned pregnancies in this study were likely to have experienced mistimed versus unwanted pregnancies (Maxson & Miranda, 2011) which may have influenced the lack of direct association between pregnancy intention and several of the child behavioral outcomes. Future studies could avoid these biases by assessing pregnancy intention prior to or closer to the time of conception (Kavanaugh & Schwarz, 2009; Schwartz et al., 2010).

Assessment of depressive symptoms in pregnancy may also have been biased. Depressive symptoms were assessed using the Beck Depression Inventory, which has been suggested as a less accurate measure of depression during pregnancy compared to the Edinburgh Postnatal Depression Scale (EPDS) or the Center for Epidemiologic Studies Depression Scale (CES-D) as it focuses on somatic symptoms that may overlap with common pregnancy symptoms (Ryan, Milis, & Misri, 2005). Therefore, the BDI may overestimate depressive symptoms during pregnancy. Future studies should use the EPDS or CES-D to more accurately assess depression during this time.

Finally, 67.2% of the original sample was lost to attrition, and the analytic sample only included mothers who remained in the study until the final assessment when children were 36 months old. The mothers who remained in the study were significantly older and more likely to be in a relationship at the birth of their children compared to those who dropped out of the study before the final assessment. Therefore, those who dropped out of the study were likely at higher risk for negative child outcomes which may have underestimated the associations among pregnancy intention, depressive symptoms, parenting stress, coparenting satisfaction, and children's outcomes in this study.

5.3 Implications

Despite its limitations, this study adds to the literature on unplanned pregnancy in many ways and provides implications for future research and clinical practice.

5.3.1 Implications for Future Research

Overall, the findings from this study indicate that the association between pregnancy intention and child outcomes warrants further investigation. Identification of additional mechanisms in the association is important as it will inform practice to prevent negative child outcomes among families experiencing unplanned pregnancies. More specifically, this study provides initial evidence for the role of relational factors as mechanisms in the association between pregnancy intention and child outcomes through examination of coparenting satisfaction. This finding is consistent with Family Systems Theory assertions about the interdependence of family members and importance of considering all family members in order to understand children's outcomes (Cox & Paley, 1997). Future research should include fathers' perceptions of pregnancy intentions, mental health, coparenting, and children's outcomes. The inclusion of fathers or other coparents in research may reveal additional mechanisms in the association between pregnancy intention and children's outcomes which could provide implications for clinical practice. Further, inclusion of fathers would allow for dyadic data analyses to test Family Systems Theory's assertions of interdependence among parents.

The nonsignificant associations among pregnancy intention and children's externalizing, internalizing, and dysregulation were inconsistent with previous literature. These associations should be studied further to identify for whom and under what conditions they are present. It is possible that the associations may depend on who reports on children's behaviors. As previously stated, a limitation of this study was the use of only mothers' reports of children's outcomes.

Future studies could reduce biases and improve accuracy by including multiple reports of children's behaviors perhaps from fathers, teachers, or children or using observational methods to assess children's behaviors and family interactions. It is also possible that children's age moderates the association such that the association emerges over time or is more salient at certain child ages. Continued study of these associations and mechanisms in the associations at various child developmental stages will be important. Finally, the lack of direct association between pregnancy intention and children's externalizing, internalizing, and dysregulation in this study may be related to the measurement or timing of mothers' reports of pregnancy intention. Again, it will be important for future research to collect reports of intention using multiple-item measures and prospectively to determine what dimensions or timing of pregnancy intention are most strongly associated with mother and child outcomes. Identification of the conditions under which the association between pregnancy intention and child outcomes is most salient will allow for targeting of interventions for the populations who are most at-risk.

5.3.2 Clinical Implications

The findings of this study also provide implications for clinical practice with families experiencing unplanned pregnancies. Results suggest that maternal pregnancy intentions are associated with children's social-emotional competence at three years old as well as mothers' depressive symptoms, parenting stress, and coparenting satisfaction over time. Therefore, it is important to provide early intervention with mothers experiencing unplanned pregnancies either in pregnancy or early in the postpartum period to prevent negative mother and child outcomes.

Findings from the cross-lagged model specifically support the Family Systems Theory concept of *equifinality* which asserts there are many pathways that lead to the same outcome (Watzlawick et al., 1967). Early intervention to address either depressive symptoms or parenting

stress may serve to promote healthy child outcomes over time through a positive cascade effect. In other words, if therapists are able to intervene with mothers to help reduce their depressive symptoms, it is likely that those improvements will contribute to less parenting stress and more coparenting satisfaction over time, which will eventually promote healthy child outcomes. Existing literature suggests that maternal depression in pregnancy and postpartum can be effectively addressed using systemically-oriented treatments (Claridge, 2014). Thus, treatments that either include mothers and their partners or specifically address relational issues in treatment may be effective in reducing mothers' depressive symptoms. Relational treatments may also be particularly helpful in addressing the coparenting relationship during the transition to parenthood (Pinquart & Teubert, 2010). Marriage and Family therapists (MFTs) are specifically equipped to provide relational treatments as they are trained in Family Systems Theory and assessment of relational dynamics. Thus, findings from this study suggest that clinicians, such as MFTs, should attempt to provide early intervention with couples during the transition to parenthood and specifically address issues of depression, parenting stress, and coparenting cooperation.

The findings also highlighted the salient role of maternal parenting stress in the association between pregnancy intention and children's outcomes in the first three years. Thus, in addition to early intervention with at-risk parents during pregnancy, parents who have experienced unplanned pregnancies may benefit from parent training interventions which serve to reduce parenting stress. Findings from recent clinical trials also indicate that parent training interventions may reduce parental depressive symptoms and improve children's outcomes (Beach & Whisman, 2012). However, it may be difficult to engage multi-stressed families, such as those who are more likely to experience unplanned pregnancies, in parent training interventions (Reyno & McGrath, 2006). Therefore, future research should seek to evaluate the

efficacy of empirically-supported parent training interventions (e.g., The Incredible Years, Webster-Stratton & Reid, 2010; Parent Management Training- Oregon Model, Patterson, Forgatch, & DeGarmo, 2010) to reduce parenting stress and depressive symptoms among families who have experienced unplanned pregnancies. Existing interventions may also require adaptations to best facilitate engagement and retention of this multi-stressed population.

5.4 Conclusions

This current study addressed several limitations of the existing unplanned pregnancy literature by including an at-risk sample of first time mothers, assessing pregnancy intention during pregnancy, and using Family Systems Theory to identify mechanisms in the association between unplanned pregnancy and children's outcomes. Results revealed that both maternal parenting stress and coparenting satisfaction when children were 24 months old served as mechanisms through which unplanned pregnancy was associated with lower social-emotional competence among 36-month-old children. A cross-lagged model further identified pathways through which unplanned pregnancy was indirectly associated with children's externalizing, internalizing, dysregulation, and social-emotional competence. In general, maternal depressive symptoms tended to predict later parenting stress which, in turn, was associated with later coparenting satisfaction and children's behavioral outcomes. Thus, the findings highlight the protective role of maternal depressive symptoms, parenting stress, and coparenting satisfaction among mothers who experience unplanned pregnancies. Early intervention during pregnancy or postpartum with at-risk mothers which specifically addresses these mechanisms may promote healthy child development over time.

APPENDIX A

TABLES AND FIGURES

Table 1

Demographic characteristics of analytic sample (N = 224).

	Total	Pregnancy Intention			
		Planned	Unplanned		
	N = 224	*n* = 53	*n* = 171		
	% or *M(SD)*	% or *M(SD)*	% or *M(SD)*	X^2	*F* (1, 222)
Infant gender (female)	47.3	47.2	47.4	.01	
Maternal characteristics					
Age (years)	22.00 (5.45)	25.90 (4.99)	20.78 (5.01)		42.27***
Education				42.50***	
Less than high school	42.3	22.6	48.6		
Completed high school	21.2	15.1	23.0		
Some college	13.9	13.3	14.2		
Completed college	22.6	49.0	14.2		
Race				22.91**	
White	23.7	34.0	20.5		
Black	55.8	32.1	63.2		
Hispanic	17.8	32.1	13.5		
Other	2.7	1.8	2.8		
Study Classification				39.84***	
Adult- high education	21.4	47.2	13.5		
Adult- low education	26.8	35.8	24.0		
Adolescent	51.8	17.0	62.6		

Table 1- Continued

	Total	Pregnancy Intention			
		Planned	Unplanned		
	N = 224	*n* = 53	*n* = 171		
	% or *M(SD)*	% or *M(SD)*	% or *M(SD)*	X^2	*F* (1, 222)
Paternal characteristics					
Age (years)	24.60 (7.66)	29.46 (7.25)	23.15 (7.18)	29.61***	
Education				40.71***	
Less than high school	31.5	20.0	35.7		
Completed high school	37.5	24.0	42.5		
Some college	10.9	8.0	12.1		
Completed college	20.1	48.0	9.7		
Race				18.67**	
White	21.4	35.3	17.2		
Black	58.2	33.3	65.7		
Hispanic	16.4	25.5	13.6		
Other	4.0	5.9	3.5		
Parental relationship status				63.01***	
Married	22.1	60.4	10.1		
Single	54.1	18.9	65.1		
With partner	23.0	20.8	23.7		
Separated/ Divorced	0.8	0.0	1.2		

Note. Demographic characteristics for both parents were reported by mothers at the prenatal interview.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2

Correlation matrix for study measures (N = 224).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Intention	___													
2. $Coparenting_{12}$	.27**	___												
3. $Coparenting_{24}$	.31***	.51***	___											
4. $Coparenting_{36}$	.14	.55***	.68***	___										
5. $Stress_{12}$	-.15	-.30**	-.39***	-.20*	___									
6. $Stress_{24}$	-.21*	-.36**	-.24*	-.41***	.66***	___								
7. $Stress_{36}$	-.10	-.28**	-.30**	-.28**	.53***	.75***	___							
8. $Depression_{Pre}$	-.14*	-.04	-.07	.01	.31***	.35**	.29***	___						
9. $Depression_{12}$	.02	-.16	-.03	-.10	.54***	.55***	.41***	.35***	___					
10. $Depression_{24}$	-.06	-.08	-.08	-.20*	.30***	.45***	.38***	.26***	.54***	___				
11. $Depression_{36}$	-.10	-.06	-.02	-.05	.26**	.43***	.50***	.41***	.44***	.59***	___			
12. Externalizing	-.07	-.25**	.11	-.11	.32***	.51***	.51***	.29***	.32***	.22**	.26***	___		
13. Internalizing	.01	-.14	-.04	-.09	.23**	.30**	.25**	.10	.22**	.14*	.10	.51***	___	
14. Dysfunction	.05	-.08	-.10	-.03	.34**	.42***	.36***	.13*	.37***	.24**	.15*	.59***	.59***	___
15. Competence	.21**	.12	.26**	.19*	-.26**	-.37***	-.39***	-.20**	-.14	-.21**	-.16*	-.15*	.02	-.18**

Note. The subscripts refer to the assessment time-point.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Standardized coefficients for significant pathways in final cross-lagged model of mothers' pregnancy intentions, coparenting satisfaction, parenting stress, depressive symptoms, and children's behavioral outcomes at 36 months (N = 224).

	B	SE
Autoregressive paths		
$Depression_{Pre} \rightarrow Depression_{12}$	.34***	.07
$Depression_{12} \rightarrow Depression_{24}$	.54***	.07
$Stress_{12} \rightarrow Stress_{24}$	.52***	.09
$Coparent_{12} \rightarrow Coparent_{24}$	.47***	.08
$Depression_{24} \rightarrow Depression_{36}$	.46***	.07
$Stress_{24} \rightarrow Stress_{36}$	.74***	.04
$Coparent_{24} \rightarrow Coparent_{36}$	.65***	.07
Cross-lagged paths		
$Intent_{Pre} \rightarrow Depression_{Pre}$	-.14*	1.15
$Intent_{Pre} \rightarrow Stress_{12}$	-.16*	2.69
$Intent_{Pre} \rightarrow Coparent_{12}$	.29***	1.42
$Intent_{Pre} \rightarrow Competence_{36}$	.11**	1.91
$Depression_{Pre} \rightarrow Stress_{12}$	.20**	.18
$Depression_{Pre} \rightarrow Externalizing_{36}$	.16**	.08
$Depression_{12} \rightarrow Stress_{24}$	.30***	.23
$Depression_{12} \rightarrow Dysregulation_{36}$	.16**	.12
$Stress_{12} \rightarrow Coparent_{24}$	-.19*	.04
$Stress_{12} \rightarrow Coparent_{36}$	.30**	.04

Table 3- Continued

	B	SE
$Coparent_{12}$ → $Stress_{36}$	-.17**	.15
$Stress_{24}$ → $Coparent_{36}$	-.36***	.04
$Stress_{24}$ → $Depression_{36}$	.24**	.03
$Stress_{36}$ → $Externalizing_{36}$	.42***	.04
$Stress_{36}$ → $Internalizing_{36}$	.25***	.04
$Stress_{36}$ → $Dysregulation_{36}$	.35***	.05
$Stress_{36}$ → $Competence_{36}$	-.37***	.04
$Coparent_{36}$ → $Dysregulation_{36}$	.10*	.09

Note. The subscripts refer to the assessment time-point. β = standardized coefficient; SE = standard error. Maternal age, education, race, and relationship status were included as covariates.
* $p < .05$. ** $p < .01$. *** $p < .001$.

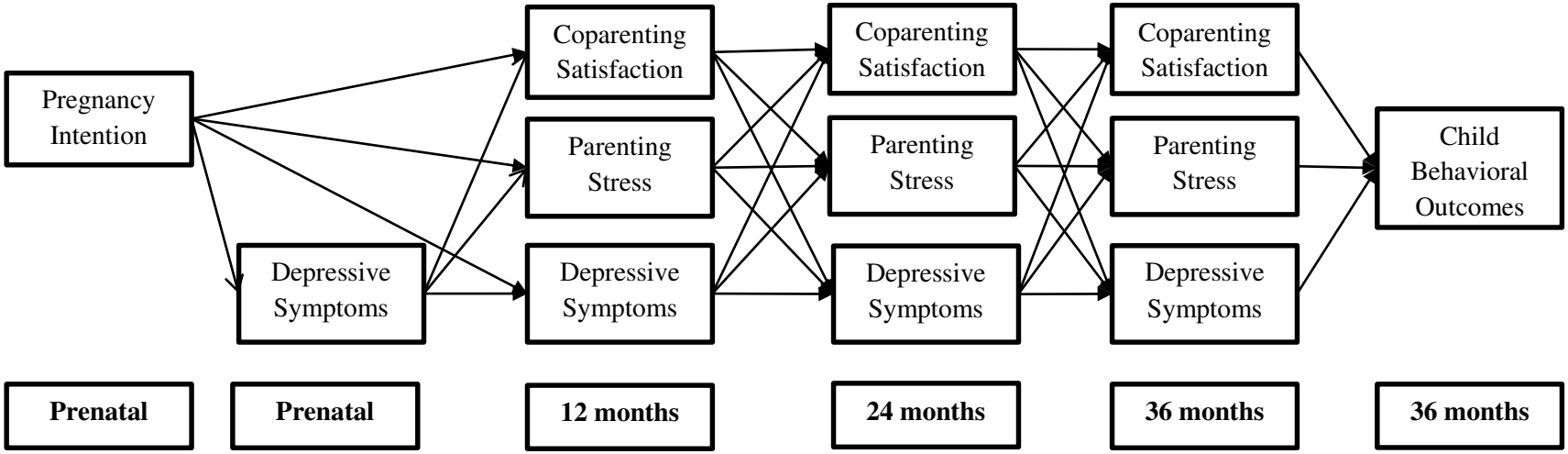

Figure 4.
Cross-lagged model of hypothesized associations among pregnancy intention, depressive symptoms, parenting stress, coparenting satisfaction, and child behavioral outcomes over the first three years (H3).

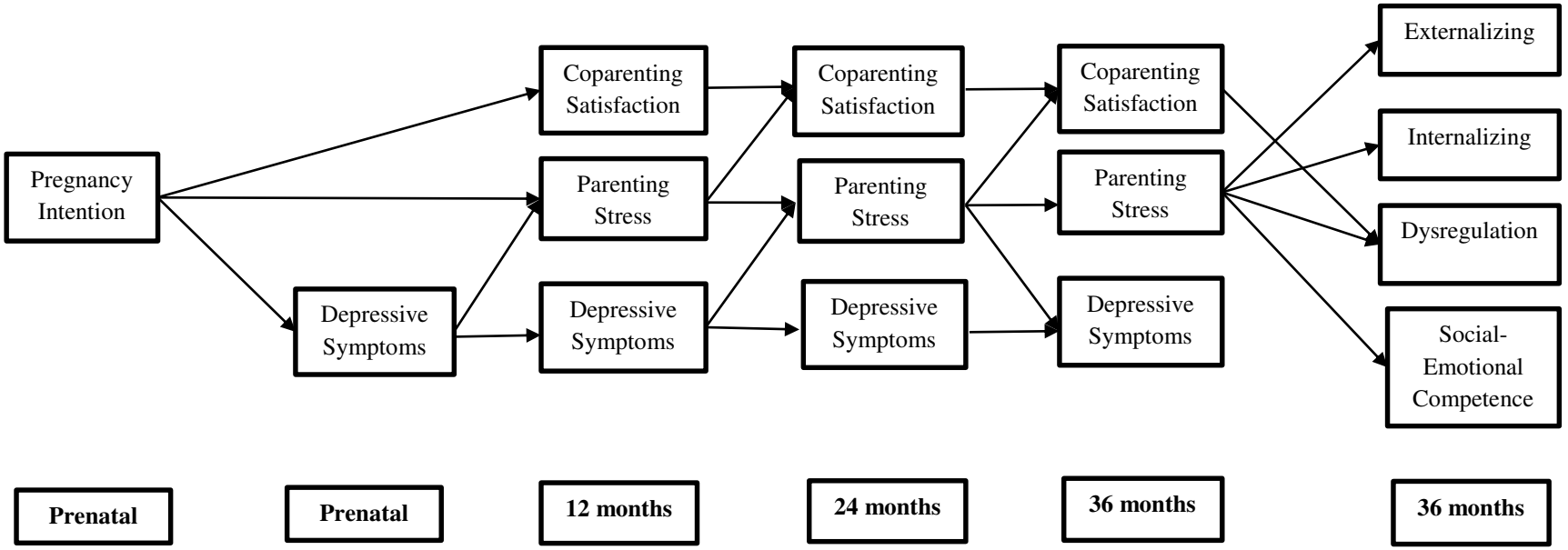

Figure 5.
Significant paths from cross-lagged model of associations among pregnancy intention, coparenting satisfaction, depressive symptoms, parenting stress, and child behavioral outcomes over the first three years (H3).

Note. Additional paths which were not hypothesized were also significant and are presented in Table 3 along with standardized coefficients. Control variables, including maternal age, education, race, and relationship status in pregnancy were also included.

APPENDIX B

IRB EXEMPTION

The Florida State University
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673, FAX (850) 644-4392

EXEMPTION MEMORANDUM
Date: 6/7/2012
To: Amy Claridge
Dept.: FAMILY & CHILD SCIENCE
From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Exploring outcomes of children and families in the Predicting and Preventing Neglect in Teen Mothers Project

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and one member of the Human Subjects Committee. The proposed research protocol is Exempt from human subjects regulations as described in 45 CFR Â§ 46.101(b)4.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This memorandum does not replace any departmental or other approvals, which may be required.

The Committee expects that all relevant subject protection measures and ethical standards will be followed, as outlined in your proposal. No continuing review is required unless the nature of the

project changes and it would affect the project exemption status.

You are advised that any change in protocol for this project that would affect the exemption status must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is FWA00000168/IRB number IRB00000446.

Cc: Lenore McWey, Advisor
HSC No. 2012.8355

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BIOGRAPHICAL SKETCH

Amy M. Claridge was born and raised in Redmond, Oregon. She received both her B.A. degree in Psychology and M.Ed. degree in Couples and Family Therapy from the University of Oregon, and her Ph.D. in Marriage and Family Therapy from the Florida State University. Amy's research interests include identifying protective factors that can be addressed in clinical interventions with at-risk, underserved families during pregnancy and the postpartum period. She is particularly interested in informing work with parents experiencing unplanned pregnancies and an unplanned transition to parenthood, and parents with histories of trauma or struggles with mental health issues in order to promote healthy development of their children over time. Amy also enjoys conducting qualitative and mixed method research that allows for gathering of in-depth information and the opportunity to give voice to marginalized populations.

Amy's clinical background and experiences continually influence her research interests. She continues to work as a couple and family therapist with at-risk families involved in the child welfare system and is currently pursing licensure as an LMFT. She is a member of the American Association for Marriage and Family Therapy and the National Council on Family Relations.