# INTERPERSONAL CONNECTEDNESS AND POSTPARTUM DEPRESSION SYMPTOMS: A GROUP INTERVENTION FOR MOTHERS AND THEIR INFANTS

by

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**Abstract**

This study utilized an intervention based upon an interpersonal theory of depression that explains postpartum mental health issues in terms of dysfunctional relationships, with the primary disruption found in the relationship between mothers and their babies (Cramer, 1993). Twenty-nine participants, who were clients in two Healthy Families New York home visiting programs, attended eight weekly groups with their infants run by non-clinical professional (NCP) home visitors. The researcher developed a curriculum, called *You, Me, and Us*, which prescribes bonding and attachment activities, cognitive behavioral strategies for addressing negative thinking patterns, and interpersonal activities to promote support within the group. Instrumentation included the Patient Health Questionnaire, Module 9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999) measuring depression symptoms and a version of the Twenty Statements Test (TST; Kuhn & McPartland, 1954) measuring interdependence. Both tests were administered at the first and eighth week of the intervention and compared to participants in a wait-listed group using a repeated measures MANOVA computed on SPSS 17.0 software. Participants in the intervention were expected to have a greater reduction in depression symptom scores and a greater increase in interdependence scores at the conclusion of the intervention when compared to those in the wait-listed group, demonstrating the viability of the intervention. It was also expected that these variables would demonstrate an inverse relationship, furthering the hypothesis that postpartum depression is integrally related to interpersonal connectedness. The analysis of the data found no support for these hypotheses. Limitations of the study design and sampling, along with trends in the data and recommendations for future research, are discussed in the conclusion.

## Dedication

This study is dedicated to mothers and their babies everywhere, in acknowledgment of the profound impact of that sacred bond. With special devotion to my own mother, who taught me the immeasurable value of maternal connectedness.

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# CHAPTER 1. INTRODUCTION

## Introduction to the Problem

Postpartum depression (PPD) is a common occurrence that not only impacts the women who experience it, but has profound effects on the development of their infants (Beebe, Jaffe, Buck, Chen, Cohen, Feldstein, et al., 2008). Researchers have documented a plethora of long-term health, social, cognitive, and language problems demonstrated by children with mothers who experienced postpartum depression (Feng, Shaw, Skuban, & Lane, 2007; Gartstein & Bateman, 2008; Kohen, Leventhal, Dahinten, & McIntosh, 2008; Lim, Wood, & Miller, 2008; Rhodes & Iwashyna, 2007; Sharp, Asten, Mills, & Kumar, 2001; Sohr-Preston, & Scaramella, 2006). Given that childhood issues related to maternal depression tend to persevere into adolescence and even adulthood (Joorman, Talbot, & Gotlib, 2007; Moran, Franklin, & O'Hara, 2006; Valdez, Barrueco, Mills, Beardslee, Sandler, & Rawal, 2008), it is paramount to intervene with this population in order to avoid potentially lifelong issues for children.

Interpersonal theory suggests that depression is rooted in relationship problems (Klerman, Weissman, Rounsaville, & Chevron, 1984; Weissman, 2006; Weissman, 2007a). Weissman (2006) gives a historical account of how interpersonal theory developed out of cognitive-behavioral theory. In traditional cognitive behavioral theory, dysfunctional thinking and the associated behaviors causes depression (Beck, 1972). Weissman (2006, 2007a) explains that in interpersonal theory, it is not just any thoughts and behaviors that are the primary culprit in depression but those specifically about relationships.

Cramer (1993) agrees with this perspective, and even goes so far as to assert that postpartum depression is primarily a relationship disorder, with the key impairment being in the cognitions and behaviors surrounding the relationship between mother and infant. The proposed study directly tested whether improvement in interpersonal connectedness, or the thoughts and behaviors surrounding relationships, is associated with an improvement in depression symptoms using a group cognitive behavioral intervention, conducted by non-clinical professionals (NCPs)[1]. The cognitive behavioral intervention, which was implemented in a primary prevention program in two counties of New York State, was informed by interpersonal theory, and therefore targeted maternal behaviors and cognitions, maternal relationships, and mother-infant interactions. It also relied upon attachment theory, with specific attention paid to interpersonal explanations of depression that depend upon key attachment relationships.

Cramer's (1993) assertion that postpartum depression is a relationship disorder reflecting a disrupted mother-infant bond that could possibly result from one's own disrupted maternal attachment, supports a subsequent body of research that demonstrates that maternal depression is best treated by addressing the interpersonal relationship between mother and child (Cohen, Lojkasek, Muir, Muir, & Parker, 2002; Nylen, Moran, Franklin, & O'Hara, 2006; O'Hara, Stuart, Gorman, & Wenzel, 2000). In light of the research showing that treating the mother-infant relationship is a key component to recovery from postpartum depression, the intervention directly targeted improvement in this relationship in the context of social support from other mothers. The 8-week

[1] "Non-clinical professionals" is a term coined for the purpose of this study as an alternative to the somewhat derogatory term "paraprofessionals" often found in the literature. Implying that home visitors are somehow outside of the professional realm is demeaning, and can be viewed as a meritocritous cheapening of the extensive training, talent, and experience of individuals who provide professional support to families.

cognitive behavioral curriculum, designed with an interpersonal component to be implemented in a group setting, was specifically tailored to address symptoms of depression while also prescribing activities and techniques for improving interactions between mother-child dyads and interpersonal functioning. It also presents opportunities for exploring the significance of key attachment relationships for the participants, and encourages reframing these experiences.

## Background of the Study

According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV-TR: American Psychiatric Association, 2005), postpartum depression does not exist as a separate disorder but is defined as a diagnosable episode of major depression that occurs within the first four weeks after delivery. Just like major depressive disorder, it is characterized by depressed mood, changes in energy, eating, and sleeping patterns, lack of pleasure or interest, feelings of guilt and worthlessness, and thoughts of death or suicide. Risk factors include life stressors such as poverty, first-time pregnancy, and pregnancy or delivery complications. However, they also include psychosocial factors such as lack of support, social isolation, and issues in the primary romantic relationship (Abbott & Williams, 2006; O'Hara, Stuart, Gorman, & Wenzel, 2000).

Stuart, O'Hara, and Gorman (2003) recommend that psychotherapy should be considered as a first course of treatment for those with PPD, instead of just as a supplement to medication. In fact, Appleby, Warner, Whitton, and Faragher (1997) found that six sessions of counseling were more effective than antidepressant medication for reducing depressive symptomatology in postpartum women. In addition to counseling's

superior effectiveness compared to medication for PPD, women who have just given birth are likely to be more open to psychotherapy than to psychopharmacology (Chabrol, Teissedre, Armitage, Danel, & Walburg, 2004).

In an Australian study, researchers found evidence supporting psychotherapeutic interventions for PPD (Milgrom, Negri, Gemmill, & Martin, 2005). After utilizing a large community program to screen mothers for depression, those who screened positive were randomly assigned to three groups: one group received a cognitive behavioral intervention, one received mental health counseling, and one received only primary care from general practitioners. As it is rare for primary care physicians to specialize in the treatment of mental health issues, they are more likely to simply prescribe medications for depression rather than suggest other treatment alternatives. In this study, the researchers concluded that the two non-medical interventions, cognitive behavioral treatment and counseling, were equally superior to primary care and led to an improvement in symptoms.

Since these and many other studies have demonstrated that psychotherapeutic interventions are effective for treating PPD, they should be evaluated as an alternative to medication. Based on the research, special attention should be paid to treatments which employ interpersonal and cognitive behavioral techniques (Weismann, 2007a). When medication is not chosen or is not deemed to be safe, cognitive behavioral therapy and interpersonal psychotherapy perform well, and should be considered to be good alternatives (Milgrom et al., 2005; Weissman, 2007b). In fact, cognitive behavioral interventions have demonstrated effectiveness for improving PPD, even with high risk maternal populations (Peden, Rayens, Hall, & Grant, 2005; Weissman & Olfson, 1995).

However, many new mothers are not willing or able to go to counseling, and many are ambivalent about medication, especially if they are breastfeeding (Chabrol et al., 2004). Holden (1996) argues that professional home visitors can be instrumental in treatment delivery. Even though they have extensive training and preparation for their roles providing support to women and families, NCPs are often viewed as non-threatening, and outside of the clinical realm. Therefore, they may be more likely to gain the trust of individuals who may have negative perceptions about mental health professionals or are distrustful of traditional counseling, Women who are already experiencing home visiting may also be more willing to attend groups run by NCPs than attend psychotherapy due to their established comfort and relationship with these individuals. While it is typical for perinatal home visitors to have a bachelor's degree or even less formal education, they are provided with substantial and ongoing job-specific training, and become informal experts on challenges faced by pregnant and parenting families (DuMont et al., 2006).

## Statement of the Problem

Postpartum depression (PPD) is a serious illness that affects 8 - 15% of women after giving birth (O'Hara & Swain, 1996; Weissman & Olfson, 1995). Not only does this disorder impact new mothers, but it also has deleterious effects on their children. For instance, it is well documented that PPD is associated with developmental delays in infants (Beebe et al., 2008). The evidence indicates that children with mothers who experienced postpartum depression are likely to experience long-term health, social, cognitive, and language problems (Feng et al., 2007; Gartstein & Bateman, 2008; Kohen

et al., 2008; Lim et al., 2008; Rhodes & Iwashyna, 2007; Sharp et al., 2001; Sohr-Preston, & Scaramella, 2006).

Maternal mental health issues can also pose a safety risk to children. Women who are depressed are more likely to neglect or harm their babies, and in extreme cases, PPD can lead to infanticide (Koenen & Thompson, 2008). Even when child safety is not a concern, other serious childhood issues are linked to maternal depression. Poor social functioning, the development of substance abuse issues, and poor academic performance is associated with maternal depression, and these outcomes tend to persevere into adolescence and even adulthood (Joorman et al., 2007; Moran et al., 2006; Valdez et al., 2008). Because of the serious implications for depressed mothers and their children, identifying and treating PPD is critically important.

## Purpose of the Study

The purpose of this research was to answer the question of whether an 8-week cognitive behavioral group intervention, implemented by NCPs, can be effective for improving not only maternal depression, but also improve ratings of interpersonal connectedness when compared to those who experience regular home visits without the intervention curriculum. Both groups were participants in a maternal home visiting program who expressed interest in participating in a "Relationship Group." After all participants were surveyed to determine which ones were willing to participate, the ones who consented to be involved were randomly assigned to either a wait-listed comparison group or the Relationship Group. This allowed for a comparison to be made between those who only received regular home visiting through Healthy Families New York, and

those who received home visiting but also attended the Relationship Group utilizing the intervention curriculum. The intervention was assessed to determine if it was successful for not only alleviating depressive symptoms for new mothers, but whether it did so in the context of improving identification with others and self-identification as a mother.

## Rationale

This study is expected to add to the body of research that exists on maternal depression. Treating depression in mothers has been shown to have a positive impact on both mothers and their children by improving the quality of the interactions in mothers-child dyads (Goodman, Broth, Hall, & Stowe, 2008). It is these very interactions that some researchers have proposed affect postpartum depression (Sharp et al., 2001). Milgrom, Ericksen, McCarthy, and Gemmill (2006) recommend utilizing cognitive behavioral techniques that specifically prescribe attending to parent-child activities in any intervention for maternal depression. However, it had not previously been tested whether these kinds of interventions, utilizing both traditional cognitive behavioral techniques for addressing depression and techniques for improving parent-child interactions, are effective for both alleviating depression and improving mothers' interpersonal connectedness in a group setting. Therefore, this study was created as a way to test whether an intervention that targets maternal depression and improves interpersonal functioning might have a highly beneficial long-term impact, potentially making a distinct contribution to the field.

This study added to the literature on postpartum depression by

- Demonstrating a possible relationship between depression symptoms and interpersonal connectedness in an experimental paradigm, furthering the hypothesis that postpartum depression is a relationship-based disorder rooted in the cognitions and behaviors surrounding relationships.
- Targeting improvement in mother-self, mother-infant, and mother-other relationships in one intervention.
- Presenting a pragmatic intervention model that is designed to be conducted by NCPs, the delivery of which makes it both practical and economically feasible for wide dissemination in community programs.

## Research Questions

Quantitative methodology was used to answer the following research questions:

ResQ1: Do the depression scores of participants in an 8-week group cognitive behavioral intervention, designed to be administered by NCPs, improve when compared to participants in the control condition?

ResQ2: Do interdependence scores on the TST for participants in an 8-week group cognitive behavioral intervention, designed to be administered by non-clinical professionals, improve when compared to participants in the control condition?

ResQ3: Is there a relationship between depression scores on the PHQ-9, a valid and reliable measure of depressive symptoms, and interdependence scores on a version of Kuhn and McPartland's (1954) Twenty Statements Test (TST), which has a history of being empirically used to measure self-perceptions of relationships, for both participants in an 8-week group cognitive behavioral

intervention, designed to be administered by non-clinical professionals, and participants in a control condition?

As such, there were three main relationships that were investigated in this research. The first was the relationship between the group cognitive behavioral intervention and mothers' depression scores on the PHQ-9. The hypothesis was that mothers in the Intervention Group would have a greater improvement in depressive symptoms, as measured by their self-report on the PHQ-9 screen, after eight weeks of attending the group compared to those in the wait-listed comparison group during the same time period.

The second relationship that was investigated was the relationship between the group cognitive behavioral intervention and mothers' interdependence scores on the TST. The hypothesis was that mothers in the Intervention Group will have a greater increase in interdependence, based on their self-descriptions on the TST, after eight weeks of attending the group compared to those in the Comparison Group during the same time period.

The third relationship that was investigated was the relationship between depression symptomatology and interdependence. Specifically, scores on the PHQ-9 were expected to vary dependent upon scores on the TST. Therefore, it was expected that there will be an inverse relationship between scores on the two instruments. In other words, it was hypothesized that as scores on the PHQ-9 go down, indicating fewer depression symptoms, scores on the TST would go up, indicating more interpersonal connectedness. In this way, the research was designed to demonstrate a fundamental tenet

of interpersonal theory in that participants' level of connection to others, their objective relationships, are directly related to the amount of depression they experience postpartum. When this interpersonal connectedness was manipulated through the use of a group intervention that specifically targets improvement in relationships, depression symptoms were expected to improve.

Intervention and Comparison Group data were compared to determine whether participants in the Intervention condition had greater improvement in depressive symptoms than those in the Comparison condition. It also investigated whether there was support for the second hypothesis, that there would be an increase in interdependence scores on the TST for those in the Intervention Group compared to the Comparison Group.

## Significance of the Study

Postpartum depression (PPD) is a serious illness that affects 8 - 15% of women after giving birth with long-term negative repercussions for their children (O'Hara & Swain, 1996; Weissman & Olfson, 1995). In addition to developmental problems experienced by children of women with PPD, women who are depressed are more likely to neglect or harm their babies, in extreme cases leading to infanticide (Koenen & Thompson, 2008). It is critical to identify and treat PPD in order to avoid the serious and potentially life-threatening implications for depressed mothers and their children.

The current research evaluated whether an intervention can affect improvements in both depression and interpersonal connectedness at once. Although relationship problems have been proposed to influence, and possibly even cause depression (Cramer,

1993; Klerman et al., 1984; Weissman, 2006; Weissman, 2007a), this study directly monitored the relationship between these two factors as measured by participants' responses on a version of Kuhn and McPartland's Twenty Statements Test (TST; 1954), and the Patient Health Questionnaire, Module 9 Depression Inventory (PHQ-9).

Due to the incredibly devastating personal and societal long-term effects of maternal depression on children (Sharp et al., 2001; Sohr-Preston et al., 2006), the cost of which has yet to be estimated, it is possible to conclude that the cost-savings to state and federal bodies of treating maternal depression by providing groups for new mothers could be astronomical. Given the research linking infant cognitive development to maternal depression symptoms, one possible long-term impact of treating maternal depression symptoms could be a positive effect on children's outcomes. Although this study did not directly measure these long-term impacts, improvements in maternal mental health are directly linked to children's capacity to handle life's challenges, making this research an exciting and relevant contribution to the professional field and society at large.

## Definition of Terms

***Depression Symptomatology.*** Depression symptomatology is defined as participants' scores on the PHQ-9 (Patient Health Questionnaire; Kroenke, Spitzer, & Williams, 2001).

***Interpersonal Connectedness.*** Interpersonal Connectedness is defined as participants' interdependence scores on the TST (Twenty Statements Test: Kuhn & McPartland, 1954)

***Non-clinical Professionals* (NCPs).** Non-clinical professionals are professionally-trained staff, such as home visitors, who have not received any formal clinical training, but who have been adequately and systematically prepared to do the work of their profession in supporting and educating families.

## Assumptions and Limitations

### Key Theoretical Assumptions

#### Maternal depression is related to interpersonal connectedness.

Researchers promoting the use of interpersonal therapy for PPD claim that depression in general, and maternal depression specifically, is a relationship disorder. Cramer (1993) suggests that postpartum depression is primarily a disordered relationship between a mother and her infant, although other authors note other disordered relationships characteristic in PPD. Although there is some evidence of a biological, or even genetic basis to PPD (Mahon, Payne, MacKinnon, Mondimore, Goes, Schweizer, et al., 2009), it is difficult to truly ascertain whether PPD is passed down in the genes or passed down through parenting. According to interpersonal theory, when girl infants have disrupted maternal relationships, it may lead to those girls growing up to have disrupted relationship with their own infants (Burrous, Crockenberg, & Leerkes, 2009; Cramer, 1993). Therefore, it is tricky to separate out whether mothers actually pass down genes for PPD, or pass down disrupted attachment. A key assumption of this study is that PPD is primarily a problem with relating. To test this assumption, the expectation would be that improvements in relating should co-occur with improvements in depression.

**Cognitive behavioral interventions are effective for improving postpartum depression.** Research indicates that postpartum depression is similar to other kinds of depression, and with some adaptations that take the parent-child interaction into account, responds well to cognitive behavioral interventions (Goodman et al., 2008; Holden, 1996; Milgrom et al., 2006). Since cognitive behavioral therapy (CBT) interventions that focus on relationships are the basis for interpersonal therapy (IPT; Weissman, 2006), addressing the cognitions and behaviors surrounding key relationships through CBT interventions addresses the theoretical underpinnings of both CBT and IPT.

**Key Topical Assumption**

**Group cognitive behavioral techniques can be used effectively by trained NCPs.** Researchers on this topic recommend training NCPs to implement interventions for postpartum depression (Ammerman, Bodley, Putnam, Lopez, & Holleb, 2006; Holden, 1996; Moran et al., 2006). Cognitive behavioral techniques are highly structured, and therefore, do not need to be administered by a clinician, although they should be supervised by a licensed professional. The assumption is that once an intervention is designed, such as with the Intervention Curriculum for the groups, it is not necessary that it is administered by a clinician. Instead, NCPs, who are already trained to administer curricula, should be able to run groups using the curriculum designed for the intervention with additional training on that specific curriculum and clinical oversight.

**Key Methodological Assumption**

**Instrumentation (PHQ-9 and TST) is effective for measuring depression symptoms and interpersonal connectedness**. The PHQ-9 is an ideal instrument for

measuring depression symptoms and is a valid and reliable tool (Kroenke et al., 2001; Spitzer, Williams, Kroenke, Hornyak, McMurray, Heartwell, 2000). The nine questions on the PHQ-9 actually correspond with the nine categories of depression symptoms in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV, American Psychiatric Association). Although this study looked at the amount of depression symptoms and did not categorize participants as depressed or non-depressed, in general scores of "10" or above are considered to indicate clinically significant depression (Kroenke et al., 2001). However, this research was not intended to identify participants as depressed or non-depressed. Specifically, it looked at levels of depression symptoms and how these differed dependent upon involvement in the intervention.

The TST has been used to measure interpersonal connectedness by many different authors. However, the construct of interpersonal connectedness has been called different names by different researchers. Many authors view it as a cultural descriptor, and describe it as *collectivism,* most often as a dichotomy on the opposite side of a spectrum to *individualism* (Eaton & Louw, 2000; Kitayama, Snibbe, Markus, & Suzuki, 2004; Markus & Kitayama, 1991; Trafimow, Triandis, & Goto, 1991; Triandis, 1993; 1995; 1996). Other authors label this dichotomy as *interdependence* vs. *independence*, and have used the TST to demonstrate differences along this spectrum (Ross, Xun, & Wilson 2002; Somech, 2000). Regardless of what it is labeled, it is clear that these researchers are discussing the same construct (Triandis, 1996). For the purposes of this study, the distinction will be called "interdependence" vs. "independence" and participants' TSTs will be evaluated for their level of interdependence.

**Sample Characteristics**

It is unclear whether the Healthy Families program population accurately represents the population of women at risk of postpartum depression. Although some of the characteristics of the sample are similar to the larger population that typically experiences this phenomenon, it is unclear whether it is a truly representative sample. One specific area of concern is that Hispanic families are overrepresented in the Healthy Families program population. This is a factor that should be investigated, but could not really be altered without eliminating some of the participants in the study, for instance by randomly eliminating some of the Hispanic participants to make the sample more accurately reflect the general population. This would have caused too much of a burden on the sample size, which was already challenged. Like other Healthy Families services, this intervention and all associated materials was available in Spanish, with a separate Spanish curriculum, and a separate group for Spanish-speakers run by a bilingual NCP.

**Measuring the Effects of the Curriculum**

Perhaps the most troubling concern about this research was how additional, unaccounted for variables could impact the results. Although the comparison with the wait-listed Comparison Group provided a strong rationale for explaining any differences between the groups, many other factors present in a study such as this could have made it difficult to demonstrate an improvement due to the groups. Specifically, the study did not control for history of mental illness, infant or maternal health problems, substance abuse or domestic violence issues, or whether or not the mother also sought traditional treatment, such as mental health counseling, in addition to receiving home visiting or the intervention. These are all factors which were likely to impact whether improvements

were made, but were not controlled for. Demographic information on participants was collected as an attempt to identify if any of these issues may have influenced results.

While it could be useful to be able to control for these factors through a different kind of design, reducing the sample size based on these characteristics would have been counterproductive. The assumption was that any of these individual characteristics, which would be likely to limit the effectiveness of the intervention, would be distributed across the groups. In other words, it is just as likely that someone with a long-term mental health issue would be in the Intervention Group as opposed to the Comparison Group, and therefore these potentially confounding individual variables should be balanced across the study.

## Theoretical Framework

This study was mainly rooted in cognitive behavioral theory and interpersonal explanations of depression. Cognitive theories of depression (such as Beck, 1972; Beck, Rush, Shaw, & Emory, 1979) are informed by research on "learned helplessness" (Seligman & Maier, 1967) and in the idea that depression is actually caused by dysfunctional cognitions. Cognitive behavioral theorists, like Beck and Seligman, assert that the solution to depression is to address inaccurate and distorted thoughts and to prescribe non-depressed behaviors; in essence, to be non-depressed, one has to learn to implement the cognitive tools of normally happy individuals (Seligman, 1990). Since hopelessness is described as being one of the main features of depression, depressed individuals tend to lose motivation to seek pleasure in things that they used to enjoy and reduce activities that could still pose some enjoyment. For instance, someone who is

depressed is likely to stop calling others and socializing, and may reduce self-care and physical activities, like exercise, which might provide some defense against depression.

Interpersonal theory, an off-shoot of cognitive behavioral theory, asserts that depression has interpersonal roots, and is essentially a relationship disorder (Weismann, 2006; Weismann, 2007a). Cramer (1993) claims that postpartum depression is primarily a disordered relationship between a mother and her infant. The tools in the curriculum are designed with these theoretical underpinnings in mind, and utilized evidence-based activities targeted to alleviate depressive symptoms for new mothers and encourage healthy interacting between mothers and their infants and mothers and their peers. By encouraging behaviors that promote self-care, self-reflection, and improve interaction between dyads in the groups, the intervention focused on the dysfunctional maternal behaviors that are symptomatic of depression.

## Organization of the Remainder of the Study

This study is comprised of five chapters. Chapter 1 contains an introduction to the problem, the purpose of the study, the research questions, significance of the study, definition of terms, assumptions and limitations, and the theoretical framework of the study. Chapter 2 describes the construct of interdependence and how relationships affect depression according to interpersonal theory. Chapter 3 describes the methodology used for this study. Chapter 4 explains the results of the study. Finally, Chapter 5 reviews the results, provides conclusions and makes recommendations for future studies.

# CHAPTER 2. LITERATURE REVIEW

## Background of the Problem

PPD is a serious illness that affects 8 - 15 % of women after giving birth (O'Hara et al., 1996; Weissman et al., 1995). According to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV-TR: American Psychiatric Association, 2000), PPD does not exist as a separate disorder, but is defined as a diagnosable episode of major depression which begins within the first four weeks after delivery. Like major depressive disorder, PPD is characterized by depressed mood, changes in energy, eating, and sleeping patterns, lack of pleasure or interest, feelings of guilt and worthlessness, and thoughts of death or suicide.

Risk factors for PPD include life stressors such as poverty, first-time pregnancy, and pregnancy or delivery complications. However, they also include psychosocial factors such as lack of support, social isolation, and issues in the primary romantic relationship (Abbott & Williams, 2006; O'Hara et al., 2000). Because some women may experience multiple adversities after delivery, this puts them at a higher risk for PPD. Interventions specifically designed to target women who are likely to be exposed to greater challenges are well-supported by the literature.

Because this common illness not only impacts new mothers, but has profound effects on their children, it is especially critical to intervene. Because cognitive behavioral interventions have demonstrated effectiveness for improving PPD, even with high risk maternal populations (Peden, Rayens, Hall, & Grant, 2005; Weissman & Olfson, 1995), this study represents an effort to utilize an evidence-informed cognitive behavioral group intervention that relies upon an interpersonal explanation of maternal

depression. The research was designed to be implemented at two sites of the Healthy Families New York home visiting programs.

## Theories for the Treatment of Postpartum Depression

There are many perspectives on appropriate treatment options for postpartum depression. Stuart et al. (2003) recommend that psychotherapy should be considered as a first course of treatment for those with PPD, instead of just as a supplement to medication. In fact, Appleby and colleagues (1997) found that six sessions of counseling were more effective than antidepressant medication for reducing depressive symptomatology in postpartum women. In addition to counseling appearing to be more effective than medication for PPD, women who have just given birth are likely to be more open to psychotherapy than to psychopharmacology (Chabrol et al., 2004).

In an Australian study, researchers found evidence supporting psychotherapeutic interventions for PPD (Milgrom et al., 2005). After utilizing a large community program to screen mothers for depression, those who screened positive were randomly assigned to three groups: one group received a cognitive behavioral intervention, one received mental health counseling, and one received only primary care from general practitioners. As is common in primary care, physicians in this study were unlikely to specialize in the treatment of mental health issues, and doctors were more likely to simply prescribe medications for depression rather than suggest other treatment alternatives. The researchers concluded that the two non-medical interventions, cognitive behavioral treatment and counseling, were equally superior to primary care with its associated medical and pharmaceutical interventions. Both non-medical interventions led to an improvement in symptoms.

Since these and many other studies have demonstrated that psychotherapeutic interventions are effective for treating PPD, they should be evaluated as an alternative to medication. Based on the research, special attention should be paid to treatments which employ interpersonal and cognitive behavioral techniques (Weismann, 2007a). When medication is not chosen or is not deemed to be safe, cognitive behavioral therapy and interpersonal psychotherapy perform well, and should be considered to be good alternatives (Milgrom et al., 2005; Weissman, 2007b). In addition, treatment strategies should take into account the mother-infant relationship and attend to the theoretical underpinnings of attachment theory.

**Attachment Theory**

The mother-infant relationship may be the most important factor to consider in the treatment of PPD. Cramer (1993) may have been one of the first authors to suggest that PPD is actually a relationship disorder reflecting a disrupted pattern of interactions between a mother and her infant which can alter the course of development and affect their future relationships and parenting choices. Attachment theory supports this position, and can be viewed as one of the most significant lenses through which to view child development. Attachment theory describes how attachment can have serious implications for learning and growth, and takes a socio-emotional perspective on development. According to the theory, the relationship between parent and child defines how a child learns to relate and interact with adults and others in his or her life. According to this theory, an infant's primary attachment to a caregiver serves as a kind of blueprint, creating an emotional template for relationships for the rest of an individual's life (Bell & Ainsworth, 1972).

John Bowlby described attachment as a connection between individuals which persists throughout a lifetime (1969). While Bowlby's contributions are numerous, perhaps his most significant description of attachment consists of a "secure base." Bowlby asserted that humans have a desire to be near to their attachment figures and young children use the attachment individual as a secure base with which to explore the world. Furthermore, anxiety results when separation from the attachment figure occurs. Bell and Ainsworth (1972) noted in their naturalistic study of 26 mother-infant pairs that mother's responsiveness to their children crying was directly related to how much the children cried, with quick responses leading to less crying. One intention of this study was to dispute the popular notion that picking up a child when he or she cries will spoil him or her.

Later, Ainsworth, Blehar, Waters, and Wall, (1978) conducted research on attachment which has become fundamental for anyone studying child development. In their "Strange Situation" research, Ainsworth and her team set up a study where a mother and young child, between 12 and 18 months old, were alone in a room. The child was left alone briefly with a stranger and then reunited with his or her mother. The child's behavior during separation and reunification led Ainsworth to develop ideas about attachment style. She described the different styles that children's attachment may take as *secure*, *ambivalent-insecure*, and *avoidant-insecure* attachment.

This study provoked further research on attachment. Main and Solomon (1986) expanded on Ainsworth et al.'s research, adding another category of attachment, which they called *disorganized-insecure.* The literature on attachment has hence found great consensus for Ainsworth et al.'s and Main et al.'s conclusions, and have revealed that

early attachment styles can predict later behaviors and outcomes for children as they move into their adult lives. A child's attachment is now largely understood to be a reflection of the interaction between mother and child, specifically hinging upon the mother's level of emotional and physical responsiveness.

The most important aspect of developing attachment styles seems to be a mother's ability to appropriately respond to her child's cues. According to research done by Smith and Pederson (1988), when Mothers are able to identify their children's verbal and non-verbal requests, and respond quickly and appropriately to them, their children tend to develop secure attachments.

**Research using attachment theory as a foundation.** Interestingly, although attachment research has been around for over three decades, the concept of spoiling a child by being responsive to them still persists for contemporary parents (Coe,Thornburg, & Ispa, 1996; Smyke, Boris, & Alexander, 2002). However, when individuals are educated about attachment theory, such as in a student lecture, they are less likely to support the concept of being able to spoil an infant by responding to them (Coe et al., 1996) suggesting that this belief may be malleable and able to be mediated through education. It also suggests that a program that seeks to improve the mother-child relationship should take into account the findings on attachment theory and find a way to communicate these to parents.

While infant attachment styles are not identical to adult attachment styles, it is possible to predict future patterns of relating from the way children relate emotionally to others. Longitudinal research has revealed that attachment styles tend to persist from childhood to adulthood, with implications for adult relationships. For instance, Hazen and

Shaver (1987) found that adults with different attachment styles hold different beliefs about relationships. While securely attached adults seem to invest in a conception of romantic love as unending, ambivalently attached adults feel that love is rare and fleeting and report relationships that are also fleeting. These perceptions directly relate to the early experiences one has with his or her parents. In fact, maternal behaviors characterized as a depressive style of interacting have been linked to less secure attachment patterns and may negatively impact future relationships.

The research on the long-term implications of attachment style is too abundant to fully explore here, but ranges from school outcomes (Davies, Woitach, Winter, & Cummings, 2008) to parenting outcomes. A recent study (Burrous, Crockenberg, & Leerkes, 2009) found that women who experience rejection from their mothers as children are more prone to depression when they have children of their own, and are likely to interpret their children's normal behavior as rejecting. Other implications for women who had poor attachment relationships as children were explored by Reid and Sullivan, (2009) who found that such women ended up more likely to be sexually victimized as teenagers and again as adults.

The literature on how a child's relationship with his or her primary caretaker translates into adulthood is extensive, and empirical evidence abounds with adult outcomes that can be linked to childhood attachment. There seem to be particularly profound implications for women, who appear to perpetuate poor attachment dynamics with their own children. Addressing attachment may help to stop a negative parenting cycle of poor interactions that could affect future generations of children.

**Interpersonal Theory**

The proposed study is rooted in interpersonal theory. It operates under the assumption that depression has its roots in relationships, and its treatment should be annexed within the context of relationships. Interpersonal therapy (IPT) is a time-limited psychodynamic treatment approach which prescribes cognitive behavioral strategies for modifying the individual's perceptions and interactions in their roles and relationships (Weissman, 2006). Originally designed at Yale, IPT was specifically created to treat major depression (Klerman, Weissman, Rounsaville, & Chevron, 1984; Weissman, 2007a). Given that PPD is not categorized as a separate disorder from major depression (American Psychiatric Association, 2000) IPT can be viewed as an appropriate treatment for this illness.

The assumption of IPT is that the status of interpersonal relationships, and problems in these relationships, precipitates the beginning of a depressive episode. In order to treat the problem, the person's interactions with others must be addressed (Weissman, 2006). In IPT, the interpersonal context in which a problem develops is of critical importance for understanding and treating any psychological illness (Weissman, Markowitz, & Klerman, 2000). Therefore, in PPD, the interpersonal context in which the illness develops is new motherhood, specifically focused on the maternal-infant relationship and the altered relationships with others in a new mother's life.

Interpersonal therapy is informed by social and psychodynamic theories, but also utilizes some cognitive behavioral techniques in that it endorses a highly structured approach, assigns homework, and focuses on skill-building (Weissman, 2006). It is intended to be a short-term therapy. The therapy systematically addresses four main problem areas: (a) grief over losses, (b) social isolation, (c) interpersonal conflict, and (d)

role changes (Weissman, 2000). The therapy focuses on processing grief, role negotiation, and the development of social skills. These problem areas can easily be identified as applying to the changing roles parenthood inflicts, and the conflict and losses associated with these changes. It is recommended that the IPT clinician focus on the changing roles of the client, for instance, from being "wife" or "partner" to also being "mother" (Clark, Tluczek, & Wenzel, 2003). According to interpersonal theory, change and growth occur within relationships, and therefore therapy must use relationships in order to facilitate transformation in treatment (Weissman, 2000).

**Interpersonal treatment for postpartum depression.** The relationship between mother and infant should be a focal point in IPT for maternal depression. According to Paris, Spielman, and Bolton (2009), treating the mother-infant dyad strengthens the relationship between the parent and her child, making the intervention more successful. Evidence from the literature on PPD demonstrates the effectiveness of interpersonal therapy that focuses on this relationship. For example, in a study of treatment efficacy comparing interpersonal psychotherapy, mother-infant psychotherapy groups, and a wait-listed comparison group, Clark et al. (2003) found that both treatment groups outperformed the comparison group in terms of improving affect for the mothers in the study. In addition to decreasing depressive symptoms, both the interpersonal therapy and mother-infant group therapy resulted in participants evaluating their infants in more positive terms and verbalizing more to them than those in the comparison group.

These findings indicate that mothers who receive treatment that focuses on relationships had richer connections with their infants as a result of these therapies. Clark et al. (2003) conclude that treatments for PPD should take into account the multiple roles

a woman plays in her relationships, including the relationship she has with her infant and should involve the baby in the treatment when possible. Furthermore, they assert that research on treatments for PPD that focus solely on symptom reduction without attending to the mother-infant relationship is shortsighted.

Other controlled research confirms that interpersonal therapy helps improve symptoms of depression in women with PPD (Stuart et al., 2003; Zlotnick, Johnson, Miller, Pearlstein, & Howard, 2001). Interpersonal therapy is an effective treatment strategy for depression in general, demonstrating a distinct advantage for treating depression over other therapies. Meta-analyses reveal that IPT performs better than many other psychodynamic therapies for resolving depression in adults (Cuijpers, van Straten, Andersson, & van Oppen, 2008). The success of IPT for PPD is possibly related to the many interpersonal and psychosocial factors which seem to lead to postpartum depression (Abbott et al., 2006; O'Hara et al., 2000). Since this modality is primarily concerned with shifting social identity, it is particularly applicable to women who often experience dramatic role transitions after giving birth (O'Hara et al., 2000). This makes the treatment a relevant and appropriate option for treating PPD.

**Cognitive Behavioral Therapy**

Cognitive behavioral approaches are an important component of IPT. Cognitive behavioral therapy (CBT) is based upon cognitive theory, which is partially informed by the theory of learned helplessness. In 1967, Seligman and Maier conducted research with dogs, which was originally designed to study conditioning. They noted that the animals that experienced repeated inescapable shock behaved in a peculiar way. The dogs who

had been shocked with no ability to escape did not try to escape later on, even when there was a clear escape route available (Seligman & Maier, 1967).

Seligman and Maier called this *learned helplessness* and eventually extended this concept to humans. They developed a model of depression in which individuals become trained to be helpless and essentially give up trying to improve their situation. Working from this model, the researchers were able to find convincing evidence that this inaccurate perception is at work in depression (Maier & Seligman, 1976). These researchers made an important contribution to the field that continues to inspire and expand understanding about depression. Seligman in particular, has devoted much of his life and career to studying depressive thinking, and is credited as the founder of the field of positive psychology, or the empirical study of happiness.

In addition to learned helplessness, other theories contributed to the development of cognitive behavioral therapy, most notably Aaron Beck's cognitive theory of depression (Beck, 1972; Beck et al., 1979). According to the cognitive model of depression put forth by Beck, thoughts precede feelings. When a person is in distress, these thoughts can become distorted. This leads to errors in thinking which support an unrealistically pessimistic view of personal efficacy, other people, and the world. Having a new baby is arguably one of life's most stressful transitions, and may be more likely to leave parents vulnerable to negative thinking. Lack of sleep, inexperience with reading a baby's cues, and added financial and emotional stressors compound the pressures new parents face. All of these can lead to loss of self-care activities and distortedly negative thinking patterns.

Cognitive behavioral theorists assert that the solution to depression is to address inaccurate and distorted thoughts and to prescribe non-depressed behaviors. In essence, to be non-depressed, one has to learn to implement the cognitive tools of normally happy individuals (Seligman, 1990). The emphasis of cognitive therapy, then, is to shed light on the distorted nature of a person's thoughts by having them pay close attention to their thinking. Cognitive behavioral therapists teach clients skills for challenging these errors in perception and replacing them with more positive, adaptive thoughts. Additionally, since hopelessness is described as being one of the main features of depression, depressed individuals tend to lose motivation to seek pleasure in things that they used to enjoy and reduce activities that could still pose some enjoyment. For instance, someone who is depressed is likely to stop calling others and socializing, and may reduce self-care and physical activities, like exercise, which might provide some defense against depression. In CBT, it is common for therapists to assign homework for clients to engage in non-depressed self-care behaviors (Beck et al., 1979).

**Cognitive behavioral treatment for postpartum depression.** The loss of self-care is amplified in PPD when new parents are confronted with the intense and relentless needs of a new baby. It is easy to fail to prioritize personal fulfillment when one is consumed with diapering, feeding, and consoling a newborn. Unfortunately, this loss of self-attendance can provide fertile ground for depression. Additionally, new mothers are prone to unrealistic expectations and inaccurate perceptions of their newborns. In a sense, the conditions of new motherhood are a set-up for depressive behavior. Because cognitive behavioral therapy (CBT) is designed to both address the dysfunctional thinking and actively change depressive and self-neglectful behavior patterns, it is an

appropriate choice for treating PPD, particularly when it takes into account factors such as the mother-infant relationship and the mother's relationships with others.

Therapy using cognitive behavioral approaches can address dysfunctional thinking, but it can also directly address the shortage of positive maternal behaviors by encouraging them in sessions and by assigning them as homework. When treating mothers' depression, some authors recommend utilizing cognitive behavioral techniques that explicitly prescribe the impaired or missing parent-child interactions (Milgrom et al., 2006). In fact, Milgrom and colleagues (2006) found that when CBT strategies ignore the importance of these behaviors and the mother-infant relationship, they are significantly less effective.

Cognitive behavioral therapy can be tailored to take the mother-infant relationship into account. In PPD, the interactions between a mother and her infant are often maladaptive. Depressed mothers engage in less eye contact, less infant-directed speech, and less physical contact with their babies. Researchers propose that the lack of these basic maternal behaviors is reported to cause long-lasting cognitive delays in children (Sharp et al., 2001). In addition to negatively impacting their infants, the suppression of these maternal behaviors also seem to compound the depression.

An example of how changing maternal behaviors can improve symptoms is by looking to research on smiling. There is evidence that smiling, even when one does not feel like it, can improve mood (Schnall & Laird, 2003). Cognitive behavioral techniques can be endorsed to increase smiling at infants. For instance, a mother could be instructed to spend the time when she is feeding and diapering her baby to consciously make herself smile and make eye contact with her baby. Based on the research on smiling, this activity,

in addition to improving her interaction with her infant, would also be likely to improve her mood. Mothers can also be informed about the impact that these missing interactions can have on her child. In this way, by directly targeting the problematic behaviors and providing psychoeducation about the importance of certain parenting exchanges, therapists have a chance to alter mothers' thinking and patterns of interacting with their infants.

These adjustments are likely to improve outcomes for children, but are also likely to positively affect symptom reduction. When a depressive style of relating and functioning is altered, depressive symptoms are likely to improve (Milgrom et al., 2006). According to many researchers, postpartum depression is similar to other kinds of depression, and with some adaptations that take the parent-child interaction into account, responds well to cognitive behavioral interventions (Goodman et al., 2008; Holden, 1996; Milgrom et al., 2006). Since changing thoughts and behaviors is the primary goal of cognitive behavioral therapy, it is an approach that should be seriously considered for attempting to adapt mother-infant interactions, and subsequently resolve PPD.

## Treating Relationships in Postpartum Depression

The quality of a woman's relationships is a key factor in PPD that affects treatment success. Evidence is accumulating to allow researchers to make the assertion that a diagnosis of PPD should warrant interventions that take psychosocial factors into account. This assessment is substantiated by research that shows that women who suffer from PPD are more likely to have difficulty navigating relationships. According to O'Hara and Swain (1996), a meta-analysis of the literature on PPD indicates that conflict in relationships and stressful interpersonal interactions are predictive of the disorder.

They note that women with PPD are more likely to report problematic relationships and issues with relating to others. Therefore, it makes sense for therapists to address psychosocial factors in their treatment approaches. In PPD, it is particularly salient to attend to the relationship between a mother and her infant.

**The Mother-infant Bond**

This idea of a disrupted mother-infant bond precipitating depression is supported by a great body of evidence that indicates that treatments for postpartum depression are most successful when they address the bonding between mother and baby. Although some authors argue that the disrupted relationship is a result of the depression rather than the cause, it is widely recognized that any treatment which seeks to improve postpartum depression must also address bonding in the mother-infant dyad (Cohen et al., 2002).

O'Hara, Stuart, Gorman, and Wenzel (2000) propose that the attachment between a mother and her child can be seriously compromised during a depressive episode. These authors report that the damage to this relationship can cause long-term problems for children. In addition, they note that the guilt and concern over the effect her depression is having on her children may exacerbate the symptoms for many women. Mothers who are already depressed may become even more depressed when they consider the negative impact their condition is having on their children.

Other maternal anxieties may also impact bonding. For instance, Smyke, Boris, and Alexander (2002) found that mothers who were afraid of spoiling their infants were less responsiveness to their babies and had higher levels of depression. Failure to respond to infants' crying quickly, which may be based upon parents' desire to avoid spoiling, may actually cause babies to become excessively fussy and harder to console (St James-

Roberts, 2007). Babies who are used to being ignored when they cry may cry harder and for longer periods of time, even after they are picked up. This can lead to mothers feeling inept, which can interfere with mother-infant bonding.

Bonding seems to be reliant upon mothers feeling successful in their parenting. When new mothers do not feel competent and secure in their ability to meet the needs of their infant, depression can result. Mazzeo et al. (2006) found that mothers' perfectionism, or pressure they feel to do everything perfectly as a new mother, is a predictor of depression. Ironically, wanting desperately to be a good parent may cause enough anxiety and concern in mothers to degrade their parenting effectiveness. Mazzeo et al.'s research indicates that mothers' serious concerns about parenting correctly may precede depression and disrupt bonding.

Regardless of what causes PPD, the negative impact on the attachment between mother and child is inarguable. Groundbreaking research on face-to-face mother-infant interactions by Cohn, Campbell, Matias, and Hopkins (1990), demonstrated that mothers who are depressed show less positive affect when interacting with their babies than mothers who are not depressed. Concurrently, the infants of depressed mothers also demonstrate less positive affect, indicating that the interaction between the pair is reciprocal, and is significantly disrupted in depression. However, treating depression in mothers has been shown to have a positive impact on children by improving the quality of these interactions (Goodman et al., 2008).

In a review of treatment approaches for PPD, authors Nylen, Moran, Franklin, and O'Hara (2006) assert that it is not sufficient for providers to primarily treat the symptoms of PPD. Instead, they conclude that it is necessary to take the mother-child connection

into account in any therapy that seeks to resolve maternal depression. These authors recommend psychotherapies that focus on the mother-infant relationship and interventions based within the home to accomplish this goal. Regardless of whether the depression or the disrupted relationship comes first, treating the interaction between mother and child is critical to resolving PPD.

**Group Treatment for Postpartum Depression**

Interpersonal therapy's focus on relationships makes it particularly suitable for addressing the multitude of relationship issues prevalent in PPD. O'Hara, Stuart, Gorman, and Wenzel (2000) found that interpersonal psychotherapy was effective for resolving not only depressive symptoms, but also caused improvement in some of these other key relationships. Since interpersonal therapy is based on the assumption that these problematic relationships create the context for depression to begin with, resolving these issues can be expected to reduce some of the client's psychological distress.

Using groups in IPT can give depressed mothers an opportunity to actively work on relationships. Reay, Fisher, Robertson, Adams, and Owen (2006) conducted a pilot study testing the effectiveness of Interpersonal Group Psychotherapy for PPD, and found an improvement in symptom severity and in ratings of interpersonal and intimate partner relationships. In this case, the group setting seemed to allow participants to work on their relationships with others, and this helped to improve their depression.

Interpersonal therapy assumes that relationship problems are the root cause of depression (Weissman, 2000). Contributing to this perspective is evidence that a history of interpersonal trauma predicts maternal depression (Ammerman, Putnam, Altaye, Chen, Holleb, Stevens et al., 2009). Ammerman et al. discuss how interpersonal conflict may

exacerbate depression and can pose a serious challenge to treatment. These authors recommend using therapeutic strategies which specifically target these relationship issues. IPT is just such a strategy, and is particularly well-suited for delivery in groups due to its focus on the very same interpersonal relationships which are proposed to be the origin of mental health disturbances.

**Interdependence and PPD**

Interdependence is a construct discussed in the literature on self-concept and cultural identity. More broadly, interdependence can be defined as the extent to which one considers others in their own self-definition (Triandis, 1996). Examples of this might be when someone describes themselves in terms of their relationships or allegiance to other people or larger groups. Describing oneself as a "sister," a "girl scout leader" or "Columbian" are examples of when self-descriptions rely upon relationships with individuals or groups. The opposite of interdependence, or independence, is the amount one relies upon individualistic descriptions of personal characteristics in their self-definition. These include physical or personality traits that are specific to the individual, such as being "smart," "tall," or "dark-skinned".

One of the main assumptions of this research is that these self-descriptions may betray underlying connections, or lack of connections, to other people in participants' lives. Interpersonal theory explains depression as caused by issues in cognitions and behaviors surrounding primary relationships (Weissman, 2006). If this explanation is correct, it can be expected that those who are depressed will describe themselves as less connected to others, or in other words as more independent, than those who are less depressed or not depressed, who should describe themselves in more relational terms.

Substantial evidence in the literature supports using interpersonal approaches, and specifically cognitive behavioral approaches that focus on relationships, for treating PPD. It makes sense to utilize these therapeutic techniques when treating women who are depressed during the postnatal period. These strategies are promising, and most likely to yield success when they take certain factors into account. Of particular importance are the factors of mother-infant interactions and addressing the mother's relationships with other key figures in her life.

**Present Study: Healthy Families New York**

The Healthy Families New York (HFNY) home visiting program is a program of Healthy Families America, which endorses a model of support for the parent-infant bond as a method for preventing child abuse and other poor outcomes. The HFNY program identifies pregnant or newly parenting families who may be at risk for abusing their children, and provides voluntary home visiting services. A home visitor may work with a family for up to five years until the target child enters Head Start or Kindergarten. HFNY is currently undergoing ongoing randomized trials by researchers at the Center for Human Services Research at State University of New York (SUNY), Albany involving 1173 families at risk for abusing and neglecting their children. Families were randomly assigned to either receive home visiting or were assigned to a control group which receives only referrals to other community resources. The research team has already begun to report significant outcomes based on several years of following the two groups (DuMont, Mitchell-Herzfeld, Greene, Lee, Lowenfels, & Rodriguez, 2006).

Some outcomes for families that receive HFNY home visiting have already been identified by DuMont et al. as follows: (a) mothers have more positive attitudes and evaluations of their children, (b) mothers are less likely to physically or psychologically abuse or neglect their children, (c) mothers are more likely to breastfeed (d) better medical care for children and fewer low birth-weight babies (e) mothers are less likely to use harmful and addictive substances (f) have greater understanding of child development and more realistic expectations of their children, and (g) are less likely to use harsh discipline.

While home-based treatment could solve some of the problems with access to treatment and dropout that are often seen with depression, a home visiting model may not be effective for reducing depression by itself (Duggan, Berlin, Cassidy, Burrell & Tandon, 2009). This research study enlisted participants from the Healthy Families New York program in two counties, but utilized a group model to administer an interpersonal intervention designed to decrease depression symptoms. The population of Healthy Families New York participants represents a diverse group of vulnerable individuals who need parenting support (DuMont et al., 2006). Most of them have risk factors, such as being a single parent, being a teen mother, or living in poverty. The program seeks to minimize the danger of these risk factors by helping to minimize stress in the home through skill development and working to improve the bond between parents and their children. The rich sample of mothering experiences makes the HFNY program an opportune environment for conducting research.

In addition, it is clear from the research on maternal depression that primary prevention that focuses on strengthening the parent-infant bond may be particularly

helpful for preventing some of the negative outcomes for children with poor attachment to caregivers. DuMont et al. (2006) found that effects of home visiting were particularly salient for psychologically vulnerable women. This would include women with depression, who are likely to have disrupted attachment to their children (Burrous et al., 2009). The participants who receive home visiting through HFNY experience many of the risk factors that put them at a discrete risk for PPD, making this an ideal population to target for intervention.

**Depression in HFNY families.** Families are recruited prenatally or just after birth, and so home visitors often encounter new mothers who are depressed. PPD is common within this sample, and is similar to the rate of postpartum depression in the general population, which seems to be from 8 – 15% (O'Hara & Swain, 1996; Weissman & Olfson, 1995). However, the rate of depression informally documented in these two programs is much higher. In a recent project designed to measure referrals for mental health treatment after systematic depression screening, the rates of positive depression screenings warranting a referral was approximately 40% (Pison & Mitchell, 2009).

Several authorities on the subject have described home visiting programs as ideal for identifying those in need of treatment for postpartum depression, and identify NCP staff as ideal for delivering the treatment (Leis, Mendelson, Tandon, & Perry, 2009). Indeed, NCPs are already trained to discuss difficult subject matter with mothers, and to address parent bonding and infant development. PPD has been proposed to be directly linked to parental attachment, and many have described PPD as symptomatic of an attachment issue (Cramer, 1993). Most researchers on the topic recognize that in order to treat PPD, it is necessary to treat the mother-infant bond (Cohen et al., 2002). This is an

area of expertise for NCPs who already attend to this relationship on a regular basis. Indeed, supporting bonding and attachment is a core principle of the HFNY program (DuMont et al., 2006) and is also integral to the curriculum.

researchers focus a lot of attention on the primary relationship between the mother and child when discussing the mental health of new mothers. In his status report on the clinical importance of infancy, Stern (2008) writes about the success of using NCPs explicitly for treating the mother-infant dyad, and how current research shows that therapies must concentrate on these interpersonal, rather than intrapsychic, factors in order to be effective.

**Treatment Administered by NCPs**

Holden (1996) argues that NCPs are able to provide opportunities to provide interventions that are not threatening for participants who may have problems accessing mental health treatment or reservations about going to traditional counseling or therapy. Holden advocates for NCPs to use concrete, behavior-modifying approaches with clients, strategies that are compatible with the pragmatic techniques endorsed by CBT. Recently, CBT approaches have already been successfully implemented into work by NCPs for other purposes, such as to minimize risk of child maltreatment (Bugental & Schwartz, 2009; DuMont et al., 2006).

Many group interventions use structured curricula and have agendas which are compatible with CBT. Prendergast and Austin (2001) developed a program to train nurses in Australia to provide a modified CBT regimen through modules that focused on discrete thought and behavior change activities. This modified treatment was credited for a high rate of recovery for the clients. Integrating cognitive behavioral strategies into a

group curriculum would be an approachable project, and could provide a non-traditional context for the treatment of PPD.

**The Treatment Curriculum**

Research shows that normal maternal activities are disrupted in postpartum depression. Mothers who are depressed talk to their infants less, touch them less, smile less, and make less eye contact with them. These are the behaviors that researchers propose result in poor outcomes for the children (Sharp et al., 2001). Maternal depression often has to do with mothers feeling overwhelmed, ill-equipped to parent, and incompetent and meeting their children's needs. Depressed mothers are particularly prone to misinterpret their babies' cues, for instance reading infant distress as anger or rejection of them (Burrous et al., 2009). Providing parenting education has been demonstrated to improve skill development and increase parental sensitivity and ability to appropriately respond to infants (Magill-Evans, Harrison, Benzies, Gierl, & Kimak, 2007). Helping mothers understand the normal development of infants can help them to accurately evaluate their babies' distress and view other behaviors as typical of infant non-verbal communication. This can provide a context for mothers so that they are less likely to take their children's behavior personally or interpret it as rejection or as their child's difficult temperament.

Such training on reading infants' cues is also likely to improve depression. Many researchers have found that treating the maternal-infant bond by literally showing mothers how to respond to their babies' needs actually improves symptoms for mothers in addition to having positive outcomes for children (Nylen et al., 2006). Therefore the treatment curriculum will focus primarily on activities and education that will make

mothers feel more competent at interpreting the nonverbal requests of their infants to benefit both mothers and their children.

One logical step in such a program was to provide psychoeducation to mothers on attachment theory relying on the work that has been done by Ainsworth et al. (1972; 1978) and other researchers. When people are educated about attachment, they tend to change their opinion (Coe et al.,1996). Since mothers may be depressed due to their own primary attachment issues (Burrous et al., 2009), understanding more about this area of research may help them to identify the problematic attachments with their own mothers, motivating them to seek to change that dynamic with their own children.

Delivering information about attachment was designed to give NCPs an opening for having mothers assess and change their interactions with their own children. Research on postpartum depression indicates that working on the parent-infant bond is critical for both symptom improvement and for reducing the risk of poor outcomes that have been linked to maternal mental health problems (Nylen et al., 2006). This was tested using the HFNY population.

## Attempting to Bridge the Gap

Similar to the randomized trial conducted by DuMont et al. (2006), this study utilized random assignment by assigning HFNY program participants to either receive specialized group treatment that focuses primarily on improving the attachment between mother and child by using a targeted curriculum, or to receive regular HFNY home visiting, which addresses the parent-infant bond, but also has numerous other program goals which occupy its administration. The curriculum focuses on educating mothers

about specific behaviors which promote bonding, and prescribes activities to encourage healthy relating.

Those who receive the intervention were compared to those in a wait-listed control group who do not initially receive the intervention. The study used instrumentation specifically designed to measure depression and interdependence in order to assess progress and compare the two groups. Mothers who attended the groups were expected to increase their ability to appropriately respond to their infants leading to improved depression symptomatology. Thus, those in the treatment group were expected to have lower depression scores and describe themselves in more interconnected terms than those in the wait-listed comparison group at the conclusion of the intervention.

It is clear from the literature that when attachment is compromised, both mothers and infants suffer. Research demonstrates that mothers may actually become depressed due to their concerns and feelings of inadequacy about parenting, and children can be exposed to the long-term personal consequences of their mothers' depression. Therefore, treatments that intervene in postpartum depression by addressing the attachment relationship may actually be *preventive,* in that they are likely to prevent some of the devastating repercussions of maternal depression on children's development. Understanding how the attachment relationship impacts both mothers and children is a critical component to understanding PPD. This study attempted to demonstrate that focusing on relationships is a successful framework for conducting research on treatments for postpartum depression.

# CHAPTER 3. METHODOLOGY

This study tested the hypothesis that involvement in a postpartum group that focuses on relationship building, with special attention paid to the relationship between participants and their new babies, would improve depression symptoms. Quantitative methodology was used to answer the questions of whether an eight-week cognitive behavioral group, run by NCPs, reduced depressive symptoms of postpartum women and increase participants' self-perceptions of interdependence. Postpartum women involved in two home visiting programs in New York who agreed to participate in "Relationship Groups" were randomly assigned to either an intervention group or a wait-listed control group. Quantitative analysis was used to see if participants' scores on measures of depression symptoms and interdependence differed between the groups.

## Participants

In order to access the population of interest, namely new mothers at risk for postpartum depression, participants were recruited from the pool of new mothers in two counties of the Healthy Families maternal home visiting program in New York, which will be hereafter identified as Program A and Program B. Participants generally represent the larger population of the two counties, although there seems to be disproportionately greater participation in both programs by the undocumented Hispanic population than is representative of the general population of the two counties.

While there are no economic or demographic criteria for participation in the programs other than living in the target areas, because Program A and Program B are child abuse primary prevention programs, there are certain characteristics that make a mother more likely to receive services, such as: being unmarried, being a first time

mother, being under 21, having considered abortion or having been unhappy about the pregnancy early on, having little social support, having delayed prenatal care, and having limited financial resources.

As such, these risk characteristics may be more prevalent for this sample than for the population of interest at large and some of these characteristics may overlap with a tendency toward postpartum depression (DuMont et al., 2006). For instance, younger, unmarried first-time mothers with limited income might be more likely to experience depression than more experienced married mothers with an adequate income. In addition, the social isolation experienced by immigrant Hispanic mothers, who primarily speak Spanish and may have little family or social support in this country, might contribute to a tendency toward postpartum depression in this sample.

**Exclusionary Criteria**

Participants were recruited out of the pool of Healthy Families New York participants in Program A and Program B. Mothers with infants eight months old or younger who had adequate literacy in either English or Spanish were invited to participate and given information about the study. Literacy was assessed by the participants' assigned home visitors, who regularly bring materials to the home and can determine whether reading is a significant enough challenge that would make participants inappropriate for the study. Home visitors gave the participants a literacy score from 1- 4 as follows: 1 = *participant has trouble with reading and comprehending all or most material given*, 2 = *participant struggles with reading and comprehending written materials*, 3 = *participant can read and comprehend most written materials with little or*

*no assistance*, or 4 = *participant can independently read and comprehend all written material*. Participants given a score of 1 or 2 were excluded from the study.

**Random Assignment**

After all participants who were deemed appropriate for the study based upon the age of their infants and literacy level were identified and recruited, those who consented to participate were randomly assigned to either the Intervention or Comparison groups. Each site (Program A and Program B) were pooled and assigned separately so that participants in each county are assigned to attend groups in their appropriate county. English-speaking and Spanish-speaking individuals were also pooled and randomly assigned separately so that there were comparable numbers of each in each of the two groups.

Attempts were made to run groups at times that participants identified as convenient to attend, but some attrition was expected. It was predicted that approximately 25% would be unable to attend groups due to timing or transportation considerations. Because of this, a maximum of 20 participants were targeted for each of the following subgroups, with an expected number of 15 attending after attrition. The stratified random assignment led to two main groups (Intervention and Comparison) with four sub-groups in each:

**Intervention group.**

1. Program A English Speaking (target: 15 participants)
2. Program A Spanish Speaking (target: 15 participants)
3. Program B English Speaking (target: 15 participants)
4. Program B Spanish Speaking (target: 15 participants)

**Comparison group.**

1. Program A English Speaking (target: 15 participants)

2. Program A Spanish Speaking (target: 15 participants)

3. Program B English Speaking (target: 15 participants)

4. Program B Spanish Speaking (target: 15 participants)

Comparison between the groups was expected to consist of the conflated scores of the four sub-groups (1 - 4) within each group, leading to an expected total of 60 participants in each group and 120 total participants. Initially separating into these subgroups was practical given the different treatment that needed to occur for each subgroup. For instance, a different NCP was needed for each sub-group in the intervention, they were run in different languages, and these groups needed to occur at different times, although concurrently. Additionally, separating the groups into these subgroups allowed for subsequent comparison between the sub-groups to determine whether there are effects of the intervention related to language or site. After assignment to the two groups, the two sub-groups were expected to be identified based upon the primary language of the participant.

## Instrumentation

In order to find support for the hypothesis that a group cognitive behavioral intervention, administered by NCPs, will improve depression symptoms and increase interdependence compared to a comparison group, it was necessary to measure both depression symptoms and interdependence for those in the Intervention and Comparison Groups. Therefore, depression scores from the PHQ-9 Depression Inventory, and

interdependence scores for the TST were compared for those in the Intervention and Comparison conditions.

**PHQ-9 Depression Inventory**

Depression symptoms were operationally defined as scores on a version of the PHQ-9 (Patient Health Questionnaire) Depression Inventory. The PHQ-9 is a module of the Patient Health Questionnaire, which is a self-administered version of a diagnostic instrument for mental disorders called the PRIME-MD. Extensive research on the PHQ-9 demonstrates validity and reliability, and additionally finds it easy to administer and interpret (Kroenke, Spitzer, & Williams, 2001; Spitzer, Kroenke & Williams, 1999). Home visitors from Programs A and B already receive extensive training and oversight in administering the PHQ-9, particularly around identifying and responding to suicidality. The agency has very explicit protocol for utilizing the PHQ-9, which is reviewed by a licensed clinical supervisor, eliminating much of the risk of this tool being used inaccurately or inconsistently. In any instance in which suicidality is a concern, a licensed clinician is immediately consulted and appropriate actions are taken to protect the individual.

The PHQ-9 was developed by Spitzer, Kroenke, and Williams (2000). The tool has been demonstrated to be a valid and reliable self-administered instrument for identifying depression (Kroenke, Spitzer, & Williams, 2001). It has also been evaluated for efficacy in an Obstetrics/Gynecological population (Spitzer, Williams, Kroenke, Hornyak, McMurray, & Heartwell, 2000), making it an appropriate instrument to be used with women during the postpartum period. It is available and has demonstrated validity in a wide array of different languages, including Spanish (Spitzer et al., 1999).

The PHQ-9 is a succinct instrument for measuring depression symptoms. The nine questions on the PHQ-9 actually correspond with the nine categories of depression symptoms in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV, American Psychiatric Association). Although this study will be looking at the amount of depression symptoms and not categorizing participants as depressed or non-depressed, scores of "10" or more on the PHQ-9 reliably correspond with a diagnosis of moderate to major depression according to DSM-IV-TR criteria, suggesting clinically significant depression (Kroenke et al., 2001). However, the current research study was not intended to identify participants as depressed or non-depressed. Specifically, the PHQ-9 was used to measure levels of depression symptoms and how these differ dependent upon involvement in the intervention. During the study, Program A and Program B protocol was followed around utilization of the PHQ-9, which mandates a mental health referral for scores over 10, and appropriate screening and risk assessment for potential suicidality.

**Twenty Statements Test (TST)**

Interdependence was operationally defined as participants' interdependence scores on a version of the Twenty Statements Test (TST: Kuhn & McPartland, 1954. No specialized training is needed to implement the TST, which is self-administered. The TST is an open-ended instrument that elicits answers to the question: "Who Am I?" with the statement: "I am…" This is repeated twenty times with twenty blank spaces for the respondent to complete the statements in any way he or she chooses. Although the TST was originally developed to explore differences between religious and non-religious individuals, more recent research applications have allowed the instrument to be used to examine other dimensions of self-identification (Carpenter & Meade-Pruitt, 2008). Most

significantly, numerous studies have used the TST, which can be administered in any language, to measure self-perceptions regarding relationships to others, making this an appropriate and relevant paradigm for assessing interpersonal connectedness (Ma & Schoeneman, 1997; Somech, 2000; Trafimow & Finlay, 2001; Trafimow, Triandis, & Goto, 1991). This study used the scoring methodology of other authors who have used this instrument to measure interdependence (Ross et al., 2002; Somech, 2000).

Using the TST to assess interdependence is a strategy that has been endorsed by many researchers (Ross et al., 2002; Trafimow et al., 1991; Somech, 2000). Although the TST has frequently been used to measure interpersonal connectedness, the construct of connectedness has been called by different names. Many authors view it as a cultural descriptor, and label it as *collectivism*, most often as a dichotomy on the opposite side of a spectrum to *individualism* (Eaton et al., 2000; Kitayama et al., 2004; Markus et al., 1991; Trafimow et al., 1991; Triandis, 1993; 1995; 1996). Other authors label this dichotomy as *interdependence* vs. *independence*, and have used the TST to demonstrate differences along this spectrum (Ross et al., 2002; Somech, 2000). Regardless of what it is called, it is clear that these researchers are discussing the same construct (Triandis, 1996). For the purposes of this study, the distinction will be called "interdependence" vs. "independence" and participants' TSTs will be evaluated for their level of interdependence.

Researchers have noted that Hispanic cultures tend to respond to the TST by making more interdependent self-statements in general compared to those from Western cultures (Triandis, 1996). Because the test will be completed by native Spanish speakers, it is expected that those in the Spanish-speaking groups will initially answer more

interdependently. However, this will be distributed across both groups, since there will be similar numbers of Spanish-speaking individuals in the intervention and comparison groups. In general, it is expected that the number of interdependent responses will increase significantly for those in the intervention group. Since there will not be a comparison of baseline scores, but only a comparison of changes of scores over the eight-week intervention, it will not matter if the Spanish-speaking group initially has higher interdependence scores. Only the change in score over time will be assessed.

Participants' responses on the TST will follow the methodology of other researchers and particular items will be scored as "interdependent" if it is a self-statement that refers to participation as a member of a group or to relationships to others and as "independent" if it is primarily a self-descriptor that refers to what makes a person physically or psychologically unique from others (Ross et al., 2002; Trafimow et al., 1991; Somech, 2000). Statements such as "I am a mother" or "I am a lawyer" are considered to qualify as referring to a relationship or to identification with a group of similar individuals, while individual descriptors, such as "I am tall" or "I am smart" are considered "independent" answers. A bilingual research assistant translated the Spanish TSTs. All identifying information was removed from the tests before being scored by two separate research assistants for agreement.

**You, Me, and Us Curriculum.**

*You, Me, and Us* is an eight-week, cognitive behavioral curriculum designed to be administered to groups of postpartum women by NCPs. The curriculum was developed specifically to be utilized with women who have their babies attend group sessions with

them. The program focuses on improvement in three discrete realms that have been identified in the research literature as related to postpartum depression:

- **YOU- Understanding healthy attachment patterns and infant development:** Mothers will gain an understanding of how their behavior impacts their child's development and what healthy attachment looks like. The curriculum addresses expectations, frustrations, and strategies for coping with difficult feelings.
- **ME- Individual depressive thoughts and behaviors.** Cognitive behavioral interventions for reducing negative thinking and increasing positive activities.
- **US- Relationships between mother-infant dyads.** Prescribed bonding activities that focus on improvement in mother-infant interactions and foster healthy attachments.

While the curriculum is cognitive behavioral in conception, it is also informed by interpersonal theory and the premise that improvement in the mother-infant relationships and how mothers perceive support are likely to improve symptoms of depression. The group setting, which in itself is supportive, and the focus on improving interactions between mothers and their infants will address the hypothesis that postpartum depression is directly impacted by the quality of these relationships.

## Procedure

This study utilized a randomized experimental design with participants randomly assigned to either an intervention group or a wait-listed comparison group. The first step in this study was recruitment of participants from Healthy Families New York programs in Programs A and B. Those willing to participate were expected to be stratified into four groups depending upon their county of residence and native language: Program A

English-speaking, Program A Spanish-speaking, Program B English-speaking, and Program B Spanish-speaking. However, due to only two Spanish-speaking participants volunteering to be involved in the study in Program A, it was not possible to randomize and run a Spanish-speaking group in Program A, so this group was eliminated from the procedure. Members within each of the other three stratified groups were then randomly assigned to either receive the treatment or to a wait-listed comparison group. During analysis, all intervention groups and wait-listed groups were conflated for comparison. Please see Table 1 below for an illustration.

Table 1

*Total Participants Across Groups*

| | Intervention | Comparison | Total Participants |
|---|---|---|---|
| Program B Spanish-speaking | 5 | 5 | 10 |
| Program B English-speaking | 5 | 7 | 12 |
| Program A English-speaking | 5 | 2 | 7 |
| Total Participants | 15 | 14 | 29 |

Those in the intervention group attended an 8-week "Relationship Group" based upon a curriculum designed to improve depression symptoms in an interpersonal setting.

Those in the wait-listed comparison group continued to receive regular home visiting during the course of the study, and were invited to attend the 8-week group at a later time, approximately one month after the conclusion of the intervention group. The wait-listed comparison group received no group treatment, but continued to receive regular home visiting through the Healthy Families New York program, with a visitation schedule of approximately once per week. Those in the intervention group also continued to receive regular home visiting while attending the groups. Therefore, both groups will receive equivalent regular home visiting, which focuses on many individual and family goals, the difference being that those in the intervention group also attended group sessions with other participants at the home visiting agency.

**Language**

Half of the groups were designed to be run in Spanish by bilingual Non-Clinical Professionals (NCPs) and half in English by English-speaking NCPs. Bilingual NCPs at both agencies are professional home visitors who are native Spanish speakers, but who are fluent in both Spanish and English. For instance, the bilingual NCPs at both sites carry caseloads which are primarily Spanish-speaking, but complete all of their documentation and communicate in the office in English.

The recruitment materials, curriculum, and assessments were all translated into Spanish by professional translators. The assessment responses on the TST were translated by a bilingual research assistant for scoring purposes after identifying information had been removed.

**Group Structure**

Research assistants were NCPs who the researcher has identified as having strong leadership skills. The researcher provided special training to the assistants to run the groups. Group time followed the eight-week curriculum, which breaks each week into three half-hour sections, with a different topic related to emotional functioning during each section. There was homework assigned each week. Participants were informed that the homework was optional, but there was time built into the group structure to review homework at the beginning of each group.

The group rooms were set up with chairs in a circle, with space in between for car seats or carriers, and blankets and baby-friendly toys in the center. The rooms were equipped with changing tables and changing supplies. Participants were encouraged to feed their babies in the group so that they did not need to leave the group to care for their infants. Additionally, research assistants set up a table with light snacks and beverages for participants to eat and drink throughout the group.

**Research Assistants**

Four research assistants (one bilingual Spanish/English-speaking and one English-speaking in each county) assisted with leading the groups, administering assessments, translating responses, and coding and scoring the data.

**Leading intervention groups.** Research assistants (RAs) were responsible for running the weekly groups, including gathering materials, printing copies of handouts, preparing the group room, and being familiar with the curriculum. Before the groups began, the researcher conducted a four-hour training session to familiarize the RAs with how to implement the curriculum, focus and structure the groups, and handle problems and emergencies.

**Addressing problems and responding to emergencies.** The researcher provided support and training for the RAs on how to address problems in the group and handle emergencies. They were trained on common group issues, such as: redirecting groups when one person takes up too much time, eliciting participation and encouraging conversation when groups are unresponsive, protecting other group members if a participant becomes hostile or aggressive, keeping to the time limits for each activity, creating a supportive environment, maintaining confidentiality, making referrals for mental health issues, and assessing for suicide.

All home visitors had already been trained in suicide risk assessment as part of the agency's protocol. They also receive regular training on addressing and referring for challenges like domestic violence, substance abuse, and mental health issues. Therefore, responding to these issues appropriately is already a part of their repertoire as professionals. They had regular support, de-briefing, and on-call supervision from the researcher to respond to any emergency, and also had support from IFH's Social Work department. Since all research participants were also be program participants, referrals could be made without identifying participants as part of the research study. Referrals followed Health Insurance Portability and Accountability Act (HIPAA) guidelines, and were preceded by the participant consenting and signing a release of information. The only exception to gaining consent would be if the RAs had gleaned information that revealed a risk to a child or if a participant was assessed to be in danger of hurting herself, as required by law and as disclosed in the consent documents. In such a case, the RAs followed agency protocol regarding suicidality and contacted the researcher.

As part of their regular duties as home visitors, the RAs are also quite familiar with running groups. The programs in both counties regularly hold group activities open to participants at the offices. The RAs received further guidance on how to intervene in the group setting in a way that does not put the participants at risk.

**Administering assessments.** Research assistants already utilized the PHQ-9 and there are agency policies and procedures about how to respond to high scores. As per the protocol in place, RAs made a referral for mental health counseling for any participant with a score of "10" or above and intervene appropriately to suicidality.

The curriculum is set up so that screening with the PHQ-9 occurred as the first activity on the first day of group. It explicitly directs RAs to administer the PHQ-9, collect it, and then hand out the TST. While participants complete the TST, the RAs are instructed to look over the PHQ-9s and score them, and identify any that have high scores or potential suicidality. If that was the case, they followed protocol surrounding suicidality and made referrals for counseling.

Like the PHQ-9, the TST is a self-administered instrument, and there is no special training needed to administer it, although the ones completed in Spanish were translated to English and research assistants were trained in how to score them.

**Coding, translating, and scoring data.** After the groups concluded, the researcher removed all identifying information from the assessments and assigned an alpha-numerical code to each participant. Three of the research assistants helped with the process of translating and scoring data. First, a bilingual research assistant translated each TST that had been completed in Spanish into English so that any of the RAs could score each test. Second, the researcher trained three of the RAs to score the TSTs for

interdependence following Somech's (2000) scoring methodology. The RAs analyzed each statement on the TST for content and categorized it as either individualistic (independent) or interdependent. Individualistic self-statements can be understood as describing how a person sees themselves as unique from others, while interdependent self-statements refer to what makes them the same or connected to others.

The TST requires that participants respond to the question "Who Am I?" by filling in the blanks on twenty lines stating: "I am…" leading to a virtually infinite number of possible responses and capturing individual variability. These statements can be interpreted as revealing how a person views themselves independently and in relationship to others. According to the scoring criteria, the RAs coded statements that referred to their individual self as individualistic, and assigned them a score of "0". Individualistic self-statements include those that refer to physical traits, or how a participant is different or unique from others, such as "I am tall," or "I am smart". Research assistants also assigned a score of "0" to statements that referred to emotional states, personal statements, and self-observations, such as "I am sad" or "I am too hot," or idiosyncratic answers such as: "I am not sure what to write." In contrast, the RAs coded statements that referred to demographic categories or relationships as interdependent and assigned them a score of "1". Interdependent statements describe what makes participants the same as others, such as membership in a group. Examples of interdependent responses include: "I am a student," "I am a mother," or "I am Puerto Rican." The total score adding up all coded responses was determined to be participants' "Interdependence" score, with higher numbers indicating a higher level of self-described interdependence.

Two RAs scored each TST independently, then discussed their scores and tried to reach agreement on the final score. Initial agreement between RAs was .96, indicating that the scoring criteria was consistently applied. In all cases, the RAs were able to reach agreement on the final interdependence scores. Since it is common for participants to not complete all 20 questions, the researcher calculated a percentage based upon the ratio of how many questions were scored with a "1" out of the total number of completed statements.

**Compensation.** The research assistants were not paid anything for their participation since all of their involvement occurred during work time and their activities were consistent with the job descriptions and not above and beyond what they are normally required to do. Research assistants were given the option to participate and volunteered to do so.

**Study Design**

Participants completed two different screens on the first and last days of the group- a PHQ-9 depression screening to measure symptoms of depression and a TST, which was used to measure interdependence. Those in the wait-listed comparison group were also administered the screens twice eight weeks apart during the same time period that the intervention group were tested. Their assigned NCPs administered the instruments during the course of their regular home visits to measure symptoms of depression and interdependence before receiving any intervention. Please see Table 2 below for an illustration of the study design over time.

Table 2

*Study Design Over Time*

| Design | Time > > > > > > | | | |
|---|---|---|---|---|
| Pretest-posttest randomized experimental | **R**<br>**R** | **O**<br>**O** | **X** | **O**<br>**O** |

**Research Question and Hypotheses**

The study design was developed in order to answer the research question of whether an eight-week Relationship Group, run by NCPs, is able to reduce depression symptoms and increase interdependence for new mothers who participate when compared to new mothers in a wait-listed comparison group.

In pursuit of answering this question, the hypotheses that were tested were:

**Hypothesis 1.** Participants who receive the group intervention will have a greater reduction in depressive symptoms (as measured by change in PH-9 scores) after participation in the eight-week group.

**Null 1.** Participants who receive the group intervention curriculum will have no difference in depressive symptoms after eight weeks compared to those who do not attend the groups.

**Hypothesis 2.** Participants who receive the group intervention will have a greater increase in interdependence scores (as measured by change in TST scores) after participation in the eight-week group.

**Null 2.** Participants who receive the group intervention curriculum will have no difference in interdependence scores after eight weeks compared to those who do not attend the groups.

***Hypothesis 3*.** There will be a relationship between participants' level of depression symptoms as measured by the PHQ-9 and their level of interdependence as measured by the TST. Specifically, an inverse relationship is expected.

***Null 3.*** There will be no relationship between participants' levels of depression symptoms and interdependence.

**Data Analysis**

A repeated measures MANOVA was employed to test the hypotheses that mothers in the intervention group (1) demonstrated significant improvement in depressive symptomatology compared to those in the comparison group, (2) scored significantly higher than comparison peers on interdependence after the intervention, and (3) that there would be an inverse relationship between depressive symptoms and interdependence scores. The chosen design is the most practical approach for answering the research questions. Random assignment to either the intervention or comparison group was employed to enable a fair evaluation of whether one-on-one home visiting alone is enough to improve scores on the chosen instruments or whether a group intervention is warranted.

A MANOVA is the appropriate analysis to handle the number of independent variables (one) and dependent variables (two). This analysis is be able to assess changes in the dependent variables based upon the dependent variables, and will also monitor the

relationship between the dependent variables. The unit of analysis for this study was group; group scores for those in the "Intervention" group were compared to those in the "Comparison" group.

## Expected Results

When the scores for all of the participants in the four sub-groups of the intervention group and the four sub-groups of the comparison group were conflated as demonstrated in Table 1, it was expected that participants in the intervention group would have significantly lower depression scores and significantly higher interdependence scores from Time 1 to Time 2 compared to those in the comparison group (see Table 1). Additionally, in support of the assertion in the literature that postpartum depression is integrally related to one's relationships with others, it was also expected that there will be a significant inverse relationship between depression and interdependence scores, with higher depression scores being associated with lower interdependence scores and vice versa.

## Ethical Issues and Limitations

In a study utilizing participants who are already receiving services, ethical issues may arise. Additionally, when addressing sensitive issues, such as depression and something as intimate as how one defines herself, several concerns arise. These concerns were addressed in the development of the recruitment materials and procedures around confidentiality.

### Persuasion

Participants who are already receiving in-home services through the Healthy Families programs could have felt pressure to participate in this study, particularly if they

have a strong relationship with their home visitor, who will be delivering the recruitment materials. To address this, the recruitment materials were carefully worded to assure potential participants that they are not required to attend and that there will be no affect on their services if they choose not to participate in the study. Material incentives were kept minimal, and directly related to the infant or the parenting relationship in order to avoid giving too high an incentive to attend so as to constitute coercion.

**Conflicts of interest.** In this study, the Primary Investigator had administrative oversight of the programs where the study took place. This conflict of interest was explored and reviewed by all three Institutional Review Boards (IRBs) clearing the study for implementation, including the Capella University, Institute for Family Health, and Office of Children and Family Services. All three IRB committees did not find this conflict of interest to be a significant threat of coercion or risk to participants, particularly due to the researcher's lack of direct contact or relationships with program participants.

**Protection of Confidentiality and Informed Consent**

Confidentiality is always a concern in any group environment. The risks to confidentially were addressed in the informed consent materials and by asking the participants to sign a "Group Confidentiality" statement, and also by a "Group Rules of Conduct" that was discussed in group during the first session. It also could have been a concern due to the multiple roles that the participant might play being a program participant and also a research participant. Participants were informed and reassured that the information that they share in group was not be part of their Healthy Families services, and was not be documented or shared with their home visitor unless they chose

to share the information or if their home visitor happens to be the individual running the group.

**Data storage.** All consent forms were only accessible to those directly involved in the study and stored in a locked filing cabinet. All data generated from the study was de-identified and numbered to protect the confidentiality of participants and this information was not shared with those outside the study. Data was stored in a password protected laptop with security features, such as three-minute screen lockout and TrueCrypt data encryption software.

**Limitations**

One limitation of the study design might be that participants who attend the group may have been inhibited in their participation if the group leader happened to be their regular home visitor. Alternately, they could have felt more comfortable, and those who have never interacted with the group leader may be inhibited. There are also limitations in how much control over confidentiality those involved in the research can actually have due to the nature of a group study where there is no way to control what is disclosed outside of the group. These limits to confidentiality were disclosed in the consent documents.

It was also considered that there could be cultural variables between the English and Spanish-speaking groups that might lead to a ceiling effect, whereby Spanish-speaking participants may initially have such high interdependence scores on the TST as a result of the overall more interdependent nature of Hispanic culture (Traindis, 1996) that there is virtually no way to increase these scores enough to demonstrate an effect. This will be analyzed and addressed in subsequent sections.

# CHAPTER 4. DATA COLLECTION AND ANALYSIS

## Introduction

This chapter gives an overview of the data collection and analysis of this research study to describe how well the findings matched up with the three main research questions investigated in this study:

ResQ1: Do the depression scores of participants in an 8-week group cognitive behavioral intervention, designed to be administered by NCPs, improve when compared to participants in the control condition?

ResQ2: Do interdependence scores on the TST for participants in an 8-week group cognitive behavioral intervention, designed to be administered by non-clinical professionals, improve when compared to participants in the control condition?

ResQ3: Is there a relationship between depression scores on the PHQ-9, a valid and reliable measure of depressive symptoms, and interdependence scores on a version of Kuhn and McPartland's (1954) Twenty Statements Test (TST), which has a history of being empirically used to measure self-perceptions of relationships, for both participants in an 8-week group cognitive behavioral intervention, designed to be administered by non-clinical professionals, and participants in a control condition?

This section will also provide a description of the sample, summary of the results, details of the analysis and results, and conclusions about the hypotheses.

## Description of the Sample

Twenty-nine individuals participated in the study, with 15 randomly assigned to

participate in the intervention group, and 14 randomly assigned to the comparison group. There were originally 76 individuals who were targeted for inclusion due to meeting the criteria of being involved in the Healthy Families Program and having a baby eight months old or under during the beginning of study. Of these, four did not meet minimum literacy requirements and were not recruited. Two individuals in Program A were not included in the study because they were the only two Spanish-speaking participants in that county interested in participating. This was not enough to randomly assign to a treatment condition, so these two individuals were invited to attend a Spanish-speaking group at a later time, but were not recruited. This left 70 individuals who were targeted for inclusion. Of these, 29 declined to participate when contacted. See the table below for an illustration of those who were targeted for inclusion, versus participation and attrition.

Table 3

*Participants Targeted vs. Actual Participation With Attrition*

| | Program B | Program A | Total Participants |
|---|---|---|---|
| Recruited | 38 | 32 | 70 |
| Declined | 9 | 20 | 29 |
| Did Not Participate | 7 | 5 | 12 |
| Participated | 22 | 7 | 29 |

Of the 41 who originally consented to participate, only 29 actually participated in the study. Twelve individuals agreed to participate, but did not follow through. This constitutes a total of 29.27% attrition between those who agreed to participate and those who actually participated. The difference between the groups in dropout is illustrated in the table below.

Table 4

*Attrition Rates by Group*

| | *Intervention* | | *Comparison* | |
|---|---|---|---|---|
| | Program B | Program A | Program B | Program A |
| Consented to Participate | 14 | 7 | 14 | 6 |
| Actually Participated | 10 | 5 | 12 | 2 |
| Attrition Rate | 28.57% | 28.57% | 14.29% | 66.67% |

There was equivalent attrition across counties in the intervention group. There was also equivalent attrition overall across intervention and control groups, with six participants in each group not continuing participation to the end of the study (28.57% vs. 30%). However, there was a substantial difference in attrition across the counties for the comparison group. This can be explained by higher overall attrition rates in Program A. In addition, the Program A groups did not include any Spanish-speaking participants. Spanish-speaking participants historically have better engagement and participation in the

HFNY program, so having a high proportion of Spanish-speaking participants (45.45%) in the Program B group was likely to yield higher overall participation and, therefore, lower overall attrition rates for that county.

**Participant Demographics**

All 29 participants were new mothers who were recruited when their babies were eight months old or younger. The women ranged in age from 19 to 41, with a mean age of 25.75. Groups did not differ much in participant age, with the intervention group having a mean age of 25.47 and comparison group having a mean age of 26.08. This difference was not significant ($t$ (26) = -.263, $p$ = .622). Babies ranged in age from .57 months old to 9.04 months old at the beginning of the study, with a mean age of 5.14 months old. Babies' ages also did not differ much across the groups, with babies in the intervention group having a mean age of 5.13 months and babies in the comparison group having a mean age of 5.14 months.

Participants self-reported their ethnicity, which overall was 48.28% Latina, 24.14% African American, and 17.24% European American, with one participant indicating more than one category and one participant declining to complete the demographic questionnaire. Ethnicity for those in the intervention group was self-reported as 42.85% Latina, 35.71% African American, and 21.43% European American, with one participant selecting more than one category. In the comparison group, there was slightly more participation by individuals who described themselves as Latina (66.67%), and slightly less participation by individuals who described themselves as European American (16.67%) or African American (16.67%), with only one participant selecting more than one category and one participant declining to complete the

demographic questionnaire. These differences in ethnicity were not found to be statistically significant across the groups ($\chi^2$ (2, $N$ = 27) = 2.469, $p$ = .481).

Table 5

*Participant Demographic Information by Group and Overall*

| | | Intervention | Comparison | Total |
|---|---|---|---|---|
| N | | 15 | 14 | 29 |
| Mean Age | Participant | 25.47 years | 26.08 years | 25.75 years |
| | Infant | 5.13 months | 5.14 months | 5.14 months |
| Participant Ethnicity | Latina | 6 (42.85%) | 8 (66.67%) | 14 (48.28%) |
| | African American | 5 (35.71%) | 2 (16.67%) | 7 (24.14%) |
| | European American | 3 (21.43%) | 2 (16.67%) | 5 (17.24%) |
| Highest Educational Level Achieved | Grade School | 3 (20%) | 5 (35.71%) | 8 (27.59%) |
| | High School | 7 (46.67%) | 9 (64.29%) | 16 (55.17%) |
| | College | 5 (33.33%) | 0 (0%) | 5 (17.24%) |
| Partner Living Situation | In home | 11 (73.33%) | 10 (71.43%) | 21 (72.41%) |
| | Out of home | 3 (20%) | 0 (0%) | 3 (10.34%) |
| | No partner | 2 (13.33%) | 2 (14.29%) | 4 (13.79%) |

From the table above, it can be seen that there was an imbalance in groups in education, with the intervention group having a higher educational achievement level

than the comparison group. Specifically, several participants in the intervention group completed college, while none in the comparison group attended college. However, these differences in educational achievement were not found to be statistically significant ($\chi^2$ (2, $N$ = 28) = 5.452, $p$ = .065).

The groups were relatively balanced in terms of partners living in the home and having no partner. There was a difference across groups for partners living outside of the home, with twenty percent of the intervention group reported having a partner living outside of the home, as opposed to none in the comparison group. Still, the differences in partner status across groups were not found to be statistically significant ($\chi^2$ (2, $N$ = 28) = 2.92, $p$ = .232).

Other demographic variables that were inquired about were fairly equivalent across the groups. For instance, only two in the intervention group, versus three in the comparison group, volunteered that they had past experience with domestic violence. One in each group reported a past substance abuse issue. Two in the intervention group and one in the comparison group indicated that they had been diagnosed with a past or present mental health diagnosis, and one from each group reported that they had been involved in mental health counseling in the past. One in each group reported having a difficult or traumatic birth with their current infant, and one in each group reported having current health issues.

## Summary of the Results

Contrary to the hypotheses of the study, a repeated measures MANOVA revealed no significant relationships between the factors measured. There were no significant differences between scores for the intervention group before and after the

intervention, and there was also no significant change in scores for participants in the wait-listed comparison group. In addition, the analyses revealed no support for the hypothesis that there would be a significant relationship between the two measured variables: depression symptoms and interpersonal connectedness.

The only significant relationship found was a consistency between depression symptoms before and after the intervention or before and after the wait-period in the comparison group. In other words, final depression scores only depended upon initial depression scores. Those who scored low tended to stay low, and those who scored high tended to stay high irrespective of the intervention. Participants' final depression scores were only predicted by their initial scores.

## Details of the Analysis and the Results

### Descriptive Statistics

The table below shows the descriptive statistics for the sample.

Table 6

*Descriptive Statistics for Outcome Measures*

| | N | Range | Min | Max | Mean | SE | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|
| PHQ-9 Time 1 | | | | | | | | | |
| Intervention | 15 | 10 | 0 | 10 | 2.41 | .75 | 2.91 | 1.56 | 2.13 |
| Comparison | 14 | 5 | 0 | 5 | 1.57 | .50 | 1.87 | .82 | -1.04 |
| Total | 29 | 10 | 0 | 10 | 2.00 | .46 | 2.46 | 1.58 | 2.65 |
| PHQ-9 Time 2 | | | | | | | | | |
| Intervention | 15 | 10 | 0 | 10 | 2.27 | .84 | 3.24 | 1.50 | 1.26 |
| Comparison | 14 | 8 | 0 | 8 | 1.43 | .63 | 2.34 | 1.99 | 4.08 |
| Total | 29 | 10 | 0 | 10 | 1.86 | .52 | 2.82 | 1.68 | 2.02 |
| TST Time 1 | | | | | | | | | |
| Intervention | 15 | .80 | .15 | .95 | .37 | .05 | .21 | 1.39 | 2.83 |
| Comparison | 14 | .70 | .30 | 1.0 | .58 | .07 | .25 | .67 | -.85 |
| Total | 29 | .85 | .15 | 1.0 | .47 | .05 | .25 | .85 | .02 |
| TST Time 2 | | | | | | | | | |
| Intervention | 15 | .55 | .05 | .60 | .29 | .05 | .18 | .50 | -1.19 |
| Comparison | 14 | .83 | .17 | 1.0 | .60 | .08 | .29 | .16 | -1.30 |
| Total | 29 | .95 | .05 | 1.0 | .44 | .05 | .28 | .69 | -.43 |

**Outcome Measures**

As can be seen in the table above, some of the outcome measures may be too skewed to use parametric testing. Due to the small sample size, some level of skewness and kurtosis can be expected. While most of the outcomes fall within the standard -1 to 1

for skewness and -2 to 2 for kurtosis, several do exceed this range. Therefore, non-parametric testing was also employed in addition to the multivariate analysis.

**Multivariate analysis.** A repeated measures MANOVA was conducted using the statistical software package SPSS 17.0.

***Assumptions of MANOVA***. One assumption of MANOVA is multivariate normality, with all of the dependent variables distributed normally. Looking at scatter plots of the dependent variables, there appears to be some skewness, particularly for the depression symptom scores. This is not surprising given the small sample size, and exploration of the data in which frequencies of PHQ-9 scores seem skewed toward "zero". Still, skewness is, in general, in the acceptable range of plus or minus one and kurtosis is in the acceptable range of plus or minus two, indicating that the sample is likely to overall be normally distributed. This slight skewness is to be expected with a small sample size measuring depression scores, where scores closer to zero are normative.

Because the sample size is small, the Shapiro-Wilk statistic was used to calculate normality. The Shapiro-Wilk statistic was found to be significant for both the first and second PHQ-9 tests ($p$ = .002; $p$ = .001) and also for the first TST ($p$ = .029), and approaching significance for the second TST ($p$ = .069). Because three of the four Shapiro Wilk tests are significant, and one is approaching significant, this can lead to a cautious interpretation of multivariate normality. Another assumption of the MANOVA is that the covariance matrices of the dependent variables are the same across groups, and this was tested with Box's $M$ = 12.716 (10, 2442), $p$ = .386. The non-significant $p$ value indicates that the hypothesis of equal covariance matrices should not be

rejected. Therefore, this assumption of MANOVA has not been violated. The third assumption of MANOVA is independence of observations. In this study, there is no information to suggest that participants' scores were influenced by one another, so the assumption that each score is independent is reasonable.

While, in general, the data seem to satisfy most of the assumptions of MANOVA, there still remains some concern about multivariate normality. Because the data does not quite satisfy the normality assumption, non-parametric testing was prudent. Due to the borderline high skewness and kurtosis, non-parametric analysis was conducted as a follow-up to the repeated measures MANOVA.

***Repeated measures MANOVA.***

Table 7

*Repeated Measures MANOVA Multivariate Tests Using Wilks' Lambda*

| Effect | Λ | *F* | Hypothesis *df* | Error *df* | Significance |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Group | .719 | 5.091 | 2 | 26 | .014* |
| Within Subjects | | | | | |
| Time | .959 | .552 | 2 | 26 | .582 |
| Time X Group | .929 | .990 | 2 | 26 | .385 |

*Significant at $p < 0.05$

The result of this multivariate test revealed at least one significant difference between groups, $F$ (2, 26) = 5.091, $p < 0.05$., a significant effect of group assignment. Tests of between-subjects effects were evaluated to determine whether group assignment impacted either depression symptom (PHQ-9) or interdependence (TST) scores. It was found that participants did not differ on PHQ-9 scores, but differed on TST scores.

Table 8

*Tests of Between-Subjects Effects*

| Source | Measure | Type III Sum of Squares | *Df* | Mean Square | *F* | Significance |
|---|---|---|---|---|---|---|
| Group | | | | | | |
| | PHQ-9 | 10.138 | 1 | 10.138 | .922 | .345 |
| | TST | .942 | 1 | .942 | 10.169 | .004* |
| Error | | | | | | |
| | PHQ-9 | 296.805 | 27 | 10.993 | | |
| | TST | 2.5 | 27 | .093 | | |

*Significant at $p$ <.005

Table 9

*Outcome Measures*

| Test & Time | Mean Score | Standard Deviation | N |
|---|---|---|---|
| PHQ-9 Time 1 | | | |
| Intervention | 2.41 | 2.91 | 15 |
| Comparison | 1.57 | 1.87 | 14 |
| Total | 2.00 | 2.46 | 29 |
| PHQ-9 Time 2 | | | |
| Intervention | 2.27 | 3.24 | 15 |
| Comparison | 1.43 | 2.34 | 14 |
| Total | 1.86 | 2.82 | 29 |
| TST Time 1 | | | |
| Intervention | .37 | .21 | 15 |
| Comparison | .58 | .25 | 14 |
| Total | .47 | .25 | 29 |
| TST Time 2 | | | |
| Intervention | .29 | .18 | 15 |
| Comparison | .60 | .29 | 14 |
| Total | .44 | .28 | 29 |

The table above highlights key differences between groups on the outcome measures of depression symptoms (PHQ-9) and interdependence (TST). As can be seen in this table, participants differed on outcome measures from the beginning of the study. A *t* test confirmed that the difference between groups on the TSTs was significant from the first time the test was taken; therefore, the groups were dissimilar on this measure from the beginning of the study, $t\ (27) = -2.419$, $p = .023$.

***Non-parametric tests.*** Due to the likelihood that the MANOVA assumptions were violated, Mann-Whitney U tests were also calculated for each of the dependent variables. According to these analyses, the groups did not significantly differ on depression scores for either testing of the PHQ-9. Those in the intervention group (*Mean* = 16.1) did not differ from those in the comparison group (*Mean* = 13.82) the first time they took the PHQ-9, $U = 88.5$, $p = .457$. Nor did those in the intervention group (*Mean* = 15.90) differ from those in the comparison group (*Mean* = 14.04) the second time they took the PHQ-9 at the end of eight weeks $U = 91.50$ , $p = .561$. While not significant, the mean ranking scores are in the hypothesized direction, with those in the intervention group having a lower mean PHQ-9 score after the intervention than before, while those in the comparison group had a higher mean PHQ-9 score after eight weeks than before.

For the interdependence variable, however, the Mann-Whitney U test revealed significant differences between the groups. Those in the intervention group (*Mean* = 11.3) significantly differed from those in the comparison group (*Mean* = 18.96) the first time they took the TST, $U = 49.50$, $p = .015$. In addition, those in the intervention group (*Mean* = 10.67) also differed from those in the comparison group (*Mean* = 19.64) the second time they took the TST at the end of eight weeks $U = 40.00$, $p = .004$.

Looking at the mean ranking scores, it is clear that the difference is opposite of the predicted direction, however. The scores on the TST for those in the intervention group reduced over the eight weeks, and the scores on the TST for those in the comparison group increased over the eight weeks. This was opposite to the hypothesis that those in the intervention group would describe themselves more interdependently after attendance in the eight week group.

## Hypotheses

The results will be reviewed for each of the three hypotheses of the study, with an indication of whether the hypothesis was supported.

**Hypothesis 1.** Participants who receive the group intervention will have a greater reduction in depressive symptoms (as measured by change in PH-9 scores) after participation in the eight-week group. There was no support found for this hypothesis.

***Differences between the groups on PHQ-9.*** Participants in the intervention group scored higher on the PHQ-9 initially, but this difference between groups was not significant, $t$ (27)= .913, $p$ = .243. Each of the groups had slight non-significant decreases in depression scores over time.

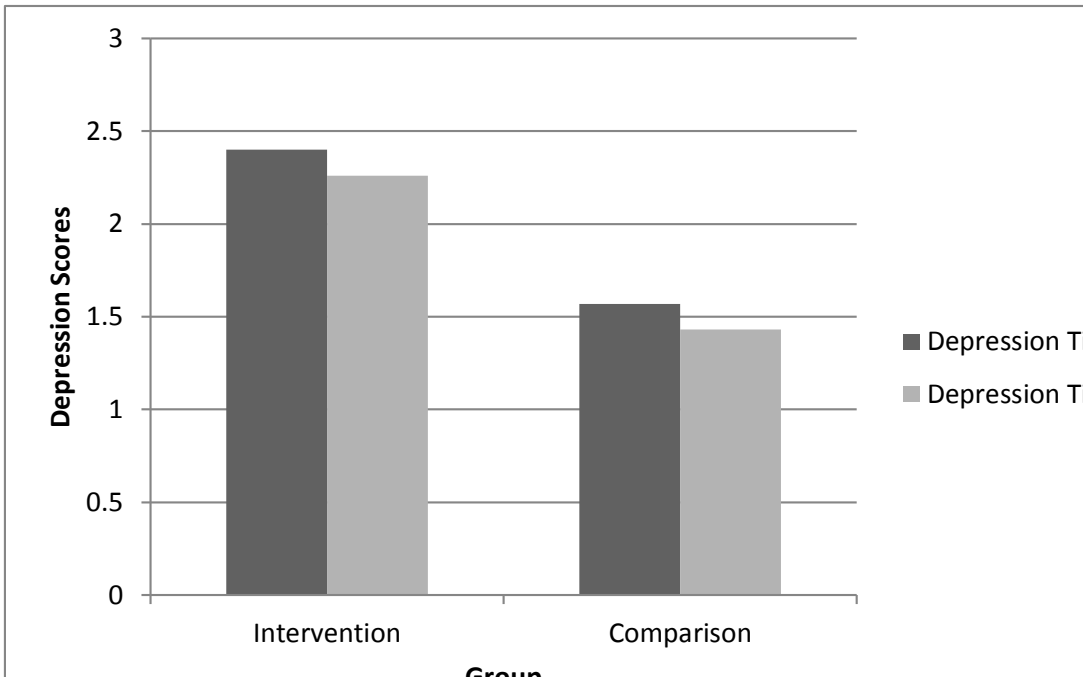


*Figure 1.* Mean PHQ-9 score differences between groups over time. This figure shows the differences between groups on PHQ-9 scores from first to second testing.

The figure above illustrates the difference between the groups on the PHQ-9 that existed before the intervention, with those in the intervention group starting off with slightly higher scores. This difference was sustained over time, with both groups trending toward slightly lower scores over time. This differed from what was found in the non-parametric version of the testing, in which the mean ranked score was lower over time for the intervention group, but higher over time for the comparison group. Regardless of which test was consulted, any changes over time did not present a significant difference between the groups.

***Depression scores.***

Rates of depression symptoms in the sample were surprisingly low. Specifically, 5 out of 29 participants, or 86.2%, scored a "4" or below on their initial PHQ-9 assessments. Since scores under 5 generally indicating an absence of clinically significant depression symptoms, this means that most of the sample scored in the clinically non-significant range on the PHQ-9. In fact, the most common score for participants in the study was *0* (ten participants), indicating no presence of depression symptoms, and then *1* (eight participants).

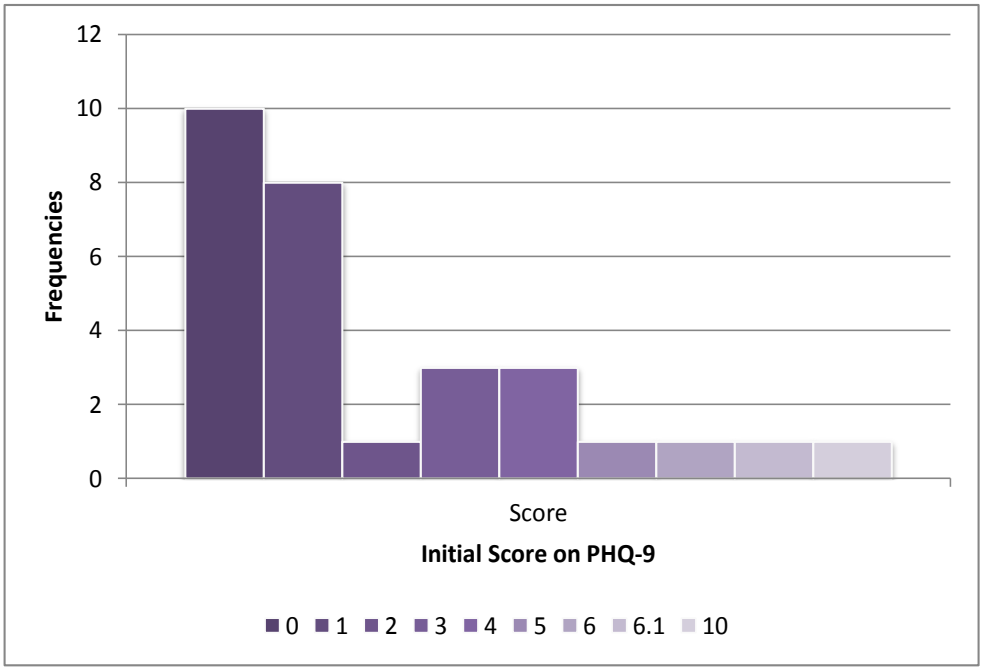


*Figure 3.* Frequencies of initial PHQ-9 scores for the entire sample. This figure clearly demonstrates the sample's overall skewness toward scores of "zero."

*Impact of treatment for non-depressed participants.* Scores under 5 are generally considered to indicate the absence of depression symptoms and not clinically significant (Spitzer, et al., 2000). Although a cutoff of 10 is usually used to determine whether intervention is needed, scores between 5 and 9 generally indicate the presence of mild symptoms that could exacerbate and therefore warrant intervention (Kroenke et al., 2001). To look more generally at change in depression scores over time, a cutoff score of "5" was used to distinguish depressed from non-depressed participants. There were only three participants in this category in the intervention group and one in the comparison group. For the 12 non-depressed participants in the treatment group, 50% stayed the same, 33.3% improved, and only 16.6% reported worsening symptoms after the eight-

week intervention. In contrast, for the three identified as "depressed" in the intervention group, two showed marked improvement (66.66%) and one had more severe symptoms after the intervention (33.33%).

***Dosage.*** While it became clear over the course of the analyses that most of the variability in the groups was due to non-equivalence in the groups, it was necessary to rule out other factors that may have accounted for variability. To determine what other factors might have accounted for variability in final depression scores, further regression analysis was conducted. In addition to the factor of initial depression scores, other factors of interest were what group a participant was assigned to and the impact of how many groups a participant attended. It was considered that the number of groups a participant attended (dosage) might have affected their final scores on the PHQ-9. However, this was not confirmed. In this analysis, there was no significant impact of dosage ($\beta = -.024$, $p = .943$) or group assignment ($\beta = -.075$, $p = .827$), but paralleling what was found in the prior regression analysis, there was a significant impact of initial depression scores on final scores ($\beta = .559$, $p = .003$), accounting for 33% of the variance in the model. Once again it was found that the only factor that had an effect on a person's final depression score was their initial depression score.

**Hypothesis 2.** Participants who receive the group intervention will have a greater increase in interdependence scores (as measured by change in TST scores) after participation in the eight-week group. There was no support found for this hypothesis.

***TST results.*** Participants in the comparison group scored higher on the TST than participants in the intervention group, and this difference was highly significant. This difference was sustained over the course of the eight weeks.

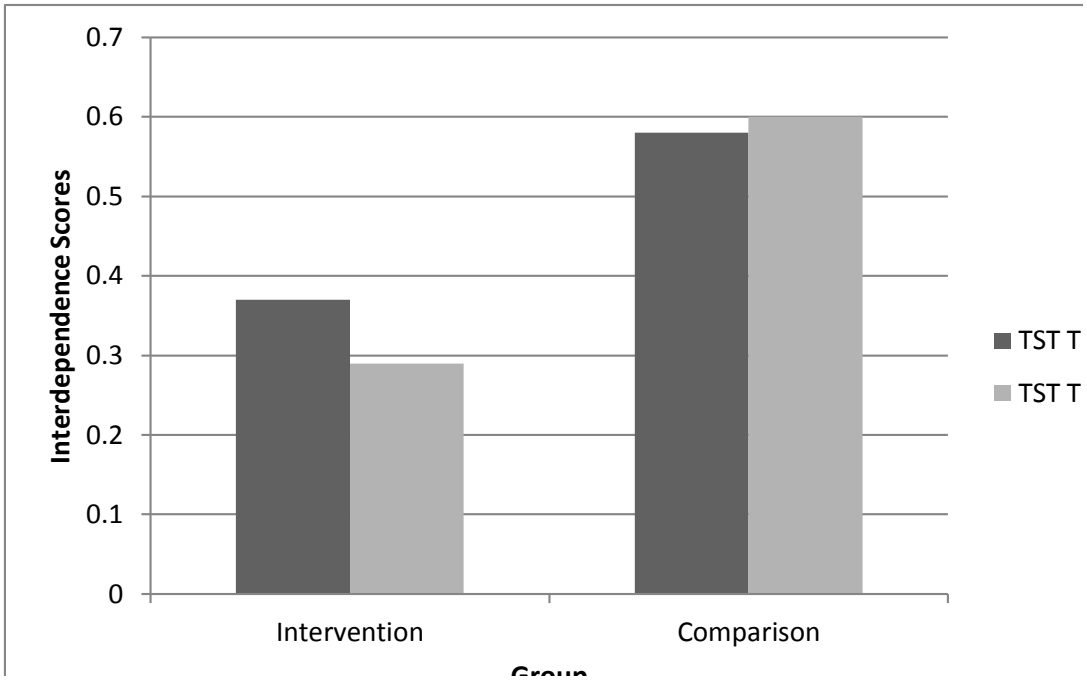


*Figure 2.* Mean TST score differences between groups over time. This figure shows the differences between groups on TST scores from first to second testing.

The figure above demonstrates that the difference between intervention and comparison groups on the TST existed from the beginning of the study and therefore cannot be considered to be an effect of the intervention. A *t* test comparing means on the initial TST scores confirmed that this discrepancy was present between the groups from the beginning of the study, $t$ (25.726) = .023 $p < 0.05$. Because of this, any difference between the groups on TST scores sustained over the eight weeks should be interpreted as an artifact of the groups' initial inequality on this measure.

Also of note is the change in interdependence scores for the intervention group. There was a slight change in TST scores from time 1 to time 2, but it was not in the hypothesized direction. Instead of the intervention leading participants to rate themselves

as more interdependently after the intervention, it appears that they were trending toward rating themselves more independently. This difference was not significant, but is an interesting finding in that the intervention seemed to produce the opposite effect on TST scores than was predicted.

In the non-parametric version of this analysis, this trend was continued, except in this version the difference between the group son the TST over time was, in fact, significant. This was opposite to the hypothesized direction, indicated that the difference between the groups was significant, but that comparison group members mean ranked score increased over time, while the mean ranked score of those in the intervention group declined over time.

**Hypothesis 3.** There will be a relationship between participants' level of depression symptoms as measured by the PHQ-9 and their level of interdependence as measured by the TST. Specifically, an inverse relationship was expected. There was no support found for this hypothesis.

***Relationships between variables.*** While no evidence was found to support the hypothesis that depression and interdependence scores would be inversely related, other relationships did exist. For those in the intervention group, a significant correlation was found to exist between participants' initial and final PHQ-9 scores, $r$ (15) = .517, $p$ = .048. The correlation between initial and final TST scores approached significance, $r$ (15) = .490, $p$ = .064. For those in the comparison group, a significant correlation was also found to exist between participants' initial and final PHQ-9 scores, $r$ (14) = .660, $p$ = .010. The correlation between initial and final TST scores was highly significant, $r$ (14) = .837, $p < .005$.

These correlations imply that there were strong relationships between participants' initial and final scores, regardless of their group assignment. Stated simply, the intervention did not affect final scores. Of most importance was the failure of the intervention to impact depression scores for participants in the intervention group. This was confirmed in a linear regression analysis, determining that 44% of variance in final PHQ-9 scores could be predicted by initial PHQ-9 scores for those in the intervention group, $\beta = .660$, $p = .010$.

Still, one trend in the relationships between variables is noteworthy: Although it was not significant, the relationship between interdependence scores and depression scores for those in the intervention group was in the hypothesized direction. The correlations revealed a non-significant negative relationship between interdependence and depression scores that persisted across time.

Table 10

*Relationships Between TST and PHQ-9 Test Scores for Intervention Participants*

| | TST Time 1 | TST Time 2 |
|---|---|---|
| PHQ-9 Time 1 | | |
| Pearson Correlation | -.242 | .012 |
| Significance | .385 | .968 |
| N | 15 | 15 |
| PHQ-9 Time 2 | | |
| Pearson Correlation | -.110 | -.179 |
| Significance | .696 | .523 |
| N | 15 | 15 |

The relationships of interest in the table above are the correlations between the TST and PHQ-9 scores for each time period. As noted, the relationships are in the hypothesized negative direction. This was what had been predicted, with scores varying on the two measures over time in an opposite direction. For instance, as interdependence scores increased, it was expected that depression scores would decrease and vice versa. This was, in fact, what the data seem to be demonstrating, although this relationship was far from significant for this sample.

**Additional considerations: Cultural differences between language groups.** There was a concern about how Spanish vs. English speakers might score on the measurements, specifically on the interdependence scores due to the reportedly higher level of interdependence of Hispanic communities and higher interdependence scores often recorded by Hispanic individuals on the TST (Triandis, 1993). Despite this consideration, Spanish-speakers and English-speakers in the intervention group did not differ on their mean scores of either administration of the TST (TST-1: $t$ (13) = 1.407, $p$ = .302; TST-2: $t$ (13) = .198, $p$ = .376). There was also no difference between language for scores on the first administration of the PHQ-9 ($t$ (13) = -.945, $p$ = .114. However, there was a significant difference between language groups on final scores of the PHQ-9, with Spanish-speakers in the intervention group having a mean score of 1.6, which was found to be significantly lower than English- speakers in the intervention group, who had a mean score of 2.6 ($t$ (13) = -.716, $p$ = .036). Since Spanish-speakers in the intervention group started out with lower PHQ-9 scores, this difference on final scores is not surprising.

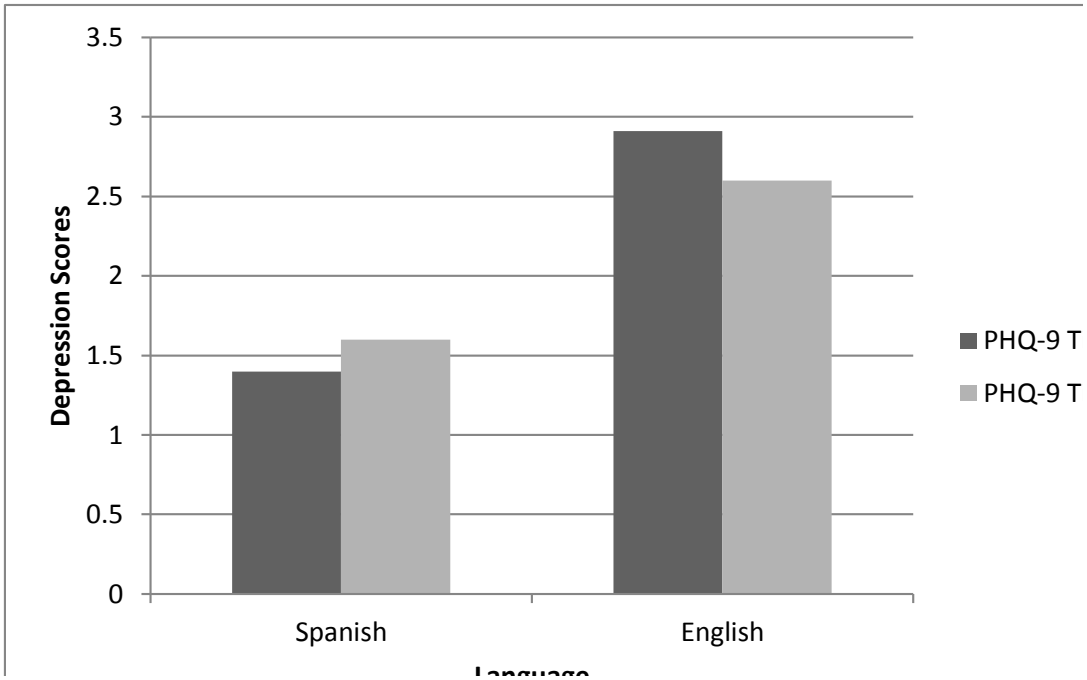


*Figure 4.* PHQ-9 Scores for Spanish-speaking vs. English-speaking over time. This figure shows the differences between Spanish-speaking and English-speaking participants on PHQ-9 scores from first to second testing.

The figure above illustrates a discrepancy between mean PHQ-9 scores for Spanish-speaking vs. English-speaking participants in the intervention group, which by the second administration became significant. As can be seen in this figure, the mean score for Spanish-speaking participants trended toward a slight increase over time, while English-speaking participants demonstrated a slight improvement in depression symptoms over time. This might indicate an advantage of the intervention for English-speakers, but due to the small number of participants in this sample, more research would be needed testing the impact of the intervention across language groups. There could also have been group effects caused by differences between group leaders, and this, too,

should be further investigated.

## Conclusion

Perhaps owing to the groups' initial non-equivalence and overall low depression scores, the analyses was not able to demonstrate any support for any of the three hypotheses of the study. Further aspects of interest will be investigated in the discussion.

# CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

## Introduction

This chapter will discuss the outcomes of the study and explore limitations that may have contributed to the results. First, it describes the findings of the study in a summary of the results. Next, a discussion of the possible interpretations for the findings in a discussion of the results follows. Following this, the conclusions of the study are presented. Then, limitations and confounding issues that may have contributed to the results are addressed. Finally, the outcomes of the study and future recommendations are reported.

## Summary of the Results

Despite designing the study as a randomized experiment, non-equivalence in the groups emerged as a major barrier to measuring the effectiveness of the intervention. Lack of symptom severity also created a floor effect whereby participants' final scores could not improve much over their initial scores, leading to a lack of ability to demonstrate a change in scores over time dependent on the group assignment. As a possible result, the analyses revealed no support for any of the three hypotheses of the study. The intervention did not significantly change depression symptom scores or interpersonal connectedness scores after participants attended the eight-week groups. There was also no relationship discovered between the variables of depression symptoms and interpersonal connectedness.

## Discussion of the Results

The results of the analysis failed to disprove the null hypotheses of the project, revealing no impact of attending the groups for participants and no relationship between

depression symptoms and interpersonal connectedness.

**Review of the Theoretical Impetus for the Study**

Postpartum depression (PPD) has been shown to negatively impact child safety and development (Koenen et al., 2008; Sharp et al., 2001), which makes it critical to intervene, not just for the individual well-being of the mothers who suffer from depression, but for the immediate and longer-term well-being of their children. The literature on the impact of relationships on PPD highlight the relationship between mothers and their infants (Cramer, 1993; Feng et al., 2007; Paris et al., 2009), setting the stage for the predictions in this study that an interpersonal treatment for mothers and their infants would help to improve that relationship and therefore, improve depression symptoms. Interpersonal therapeutic approaches have been documented to improve the symptoms of PPD (O'Hara et al., 2000; Reay et al., 2006; Stuart et al., 2003), and groups for new mothers with their babies were predicted to improve depression symptoms for the study's intervention group.

**Elements Impacting Outcomes of the Study**

Unfortunately, the depression rate in the sample from the outset was so low that it ultimately prevented demonstrating any improvement over the course of the study. This led to the simple conclusion of the study being that there was no impact of the intervention. Still, a closer look at the data reveals several areas deserving further exploration and discussion. The data tell an underlying narrative of a sample that was seriously impacted by attrition of both the larger Healthy Families New York program and the study, and was particularly biased in either the selection or in self-report toward people who presented with a surprising lack of depression symptoms. Having a sample of

participants with initial depression scores so low, left little room for improvement. Additionally, non-equivalent testing procedures, testing some participants in the home and some in the group, may have impacted scores on the instruments.

Of particular note in discussing the outcomes of the study are the following key topics:

- What are the meanings of trends of the research?
- Were participants authentic in their self-report?
- What limitations of the study make it hard to generalize results?

These topics will be elaborated upon in the remainder of this paper.

## Discussion of the Conclusions

### Trends in the Research

Although there was no significant difference between participants' first and second scores on the interdependence measure of the TST, it is interesting to note the trends. Contrary to the hypothesis, the interdependences scores of participants in the intervention group went down over time instead of going up. To clarify the way this appears, the effect of attending the group on their interdependence scores seemed to be that they described themselves as more different from others after attending the group rather than as more connected to others. Not only is this finding contrary to the hypothesis, but it seems to conflict with the literature on this measure, which predicts that relationships in groups should lead to higher group self-identification (Eaton et al., 2000).

Research on the topic indicates that group membership leads to more interdependent responses on the TST (Triandis, 1995). However, the theory behind this prediction specifies that group affiliation rather than actual testing in a group

environment will increase testing scores. One possible interpretation of this is that rather than the group impacting individuals to make them think of themselves as more interdependent, exposure to other group members exaggerated their self-perceptions of their individual differences and caused them to reflect on how they individuate from those around them. More specifically, participating in a group may have counter-intuitively led participants to reflect on how they are different from the group's other members. This seems particularly salient in contrast to those who did not attend the group, whose interdependence scores did not really vary, although in the non-parametric testing, ranked scores actually significantly increased over time.

**Issues of Self-report**

As with any self-assessment, issues of self-report limit the objectivity of the measurements. In this study, subjectivity was actually a goal of the measurement, for instance, in the very personal self-descriptions elicited by the TST. The object of interest for this measure is exactly that individual perspective that one is asked to provide when answering the self-reflective question: "Who am I?"

The PHQ-9 is also a self-report instrument. While the PHQ-9 has been found to reliably measure depression symptoms (Kroenke et al., 2001), it is not well-documented how taking the PHQ-9 in a group might impact the accuracy of self-report, and therefore the reliability of the measurement for those who are taking the screening while in the presence of peers. One could conjecture that the presence of others could inhibit candidness on the assessment. This should have led to deflated depression scores, especially since as noted previously, group leaders remarked that the responses on the PHQ-9 seemed to be minimized compared to what participants were actually reporting in

the groups. However, this would predict that those in the groups would have had lower scores initially than those who were tested in the home, yet this was not the case. Although it was not significant, group members started out with a higher mean score than those in the comparison group. One interpretation of this is that those who wanted to attend the groups actually had more depression symptoms than they volunteered, but minimized their symptoms on the initial test. There is, of course, no way to confirm this speculation.

While it is not possible to resolve the limitations of self-report in self-measurement tools, assessing participants all in the same setting initially could at least prevent some of the variability seen between groups to get more authentic baseline measurements. It could also have prevented the discrepancy between scores on the TST to have tested all participants in a parallel situation to eliminate the impact that the testing environment may have had on authenticity or number of responses.

### Limitations of the Study

In addition to the concern about self-report, several other issues arise as possible limitations of the study. These include initial differences between the groups, inadequate sample size, and low rates of depression in the sample. These limitations of the study will be addressed in the following section.

## Limitations

### Differences Between the Groups

One major concern in this study was the discrepancy between groups at the outset of the testing. When examined closely, the best interpretation of this difference is that rather than being an indication that the two groups were genuinely different on this

measure from the beginning, it may have been an artifact of different procedures utilized in the group as opposed to in the home when conducting this assessment. While some research has indicated that different testing environments do not necessarily lead to divergent scores on standard assessment instruments (Lewejohann et al., 2006), it still might be possible for the experiences of testing in the home versus in the research group could have influenced the way participants answered, especially if they were given different instructions.

This was, in fact, the case. In this study, comparison group participants were asked to complete the test in the home, but it was common for them to complete only about half of the questions. In the groups, leaders coached participants to complete the whole assessment and gave time to do so. Perhaps due to the pressure exerted by the group situation and leader influence, participants were much more likely to complete the entire assessment in the groups. In fact, when reviewing the assessments, those done in the home had on average about half of the statements completed (10), while almost all of the assessments done in the group were totally completed (20).

Carpenter and Meade-Pruitt (2008) explain how when individuals complete the TST, statements in the first half of this instrument tend to be more interdependent, while statements in the second half tend to be more independent. Participants in the comparison condition on average completed half the number of responses as those in the intervention condition. Because a proportion was used to calculate the number of interdependent responses, for someone who only completed 10 statements, there would be an increased likelihood that those 10 statements would tend to be interdependent. Individuals who completed all 20 statements would be more likely to have a mix of interdependent and

independent responses, since Carpenter et al., 2008 notes that participants tend to produce more independent responses later in the assessment. Watkins, Yau, Dahlin, and Wondimu (1997) also remark upon the impact of rank order of statements on the TST, and also how the total number of answers can impact scoring. If participants only completed half of the test, the proportion of their interdependent answers would be artificially raised. This could account for the inflated TST scores of the participants in the comparison group, a potential confound that could have been prevented in numerous ways as will be noted in the recommendations for future research.

**Sample Size**

Sample size was one of the most glaring issues in this study. While the number of originally targeted participants (70) might have been adequate to paint a representative picture of the study's effects, the rate of attrition from both the study and the program probably impacted the ability of the research project to demonstrate its true impact. Attrition in the Healthy Families New York program is common, and it can be difficult to engage participants from the target population DuMont, et al., 2006. Many strategies have been built into the program to account for the consistent and vigilant efforts required to maintain contact and recruit participants into program activities.

In this study, many of the participants who were originally identified as meeting the criteria for inclusion had dropped out of the program by the time the study was underway or during the course of the study even if they agreed to participate in the beginning. Others initially agreed to participate, but then were no longer interested or did not attend the groups. This led to an extremely whittled down sample. It is difficult to estimate the full impact of this attrition on the final results. Given the small sample size,

drawing any definitive conclusions is difficult, and it could be unwise to make generalizations about the outcomes.

**Rate of Depression in the Sample**

The rate of depression in this particular sample were surprisingly low and were not consistent with what has been documented and observed in the past about the population of Healthy Families New York (HFNY) participants in Programs A and B (Pison et al., 2009). According to quality improvement tracking of depression rates in the programs, the population of HFNY participants in the two counties where the study was conducted tends to experience high rates of postpartum depression symptoms, approximating 40% of participants scoring high enough on the PHQ-9 to warrant a referral to mental health counseling. Generally speaking, this means that at any given time, 40% of participants will be likely to have a score of ten or above on the PHQ-9, since this is the cutoff where participants are given a referral. In this study, only 1 out of 29 participants had a score of 10, and zero participants had a score over 10 at any point in the study for both the intervention and comparison groups. This constitutes a rate of 3%, which is suspiciously far from the expected 40% rate, and is even a far cry from the 8-15% expected rates of postpartum depression for the general population (O'Hara & Swain, 1996; Weissman & Olfson, 1995).

There are three possible explanations for these deflated depression scores 1. The scores are an accurate representation of participants' depression symptoms; 2. The scores are accurate, but the recruitment for the study was flawed in a way that impacted depression scores; 3. The scores are not accurate due to participants' underreporting their depression symptoms. These possibilities are explored below.

**Scores accurately represent symptoms.** One possibility is that the scores are an accurate representation of participants' depression symptoms. Although it seems statistically unlikely, it is possible with the small number of total participants (29), that recruitment and randomization yielded a sample with unexpectedly low scores purely by chance. Intuitively, this seems to be the least possible of the three explanations, leading to further exploration of the other two scenarios.

**Flawed recruitment procedures.** The PHQ-9 scores of the sample participants might be correct, but a flawed procedure may have selected out higher scoring participants. If the PHQ-9 scores are an accurate depiction of participants' authentic depression scores, it is likely that some sampling bias occurred. A flaw in the recruitment procedures may have allowed those who were particularly depressed to disproportionately opt out of the study. By targeting all participants, those who were depressed and non-depressed alike, it could have set up a recruitment paradigm where only the least depressed individuals, whose low scores on the depression instrument were consistent with their lack of symptoms, volunteered to attend. Lack of interest in social interactions is typical of depression. Those who were particularly depressed may not have been interested in participating in the study, and could have unevenly self-selected out of participating, leading to a virtually non-depressed sample.

Depression puts a person at risk for attrition from treatment in general, and this is particularly salient for those who are younger with lower incomes (Warden, Rush, Wisniewski, Lesser, Thase, Balusubrani, et al., 2009). Since postpartum depression rates are highest among low-income, urban, African American and European American woman (Hobfall, Ritter, Lavin, Hulszier, & Cameron, 1995), interventions that account

for attrition in this population may be paramount. While one meta-analysis noted high success rates with cognitive behavioral group interventions, particularly interpersonal approaches when implemented postpartum (Blesdoe & Grote, 2006), it is a challenge for clinicians and researchers alike to recruit those who need it most into treatment. One idea is to target women who are at risk for depression before they develop any symptoms, as getting them to attend groups before they develop symptoms has has been shown to reduce incidence of postpartum depression (Zlotnick, et al., 2001). Another thought is that online support groups could be a more accessible alternative to traditional group treatment, although there seems to be a dearth of research investigating effectiveness of these informal supports.

A risky assumption of this study was that there would be a rate of depression in the sample that would be comparable to the rates of depression that are typical in the HFNY population. It was also speculated that the intervention might have preventive benefit for those who may not be depressed, but are at risk for depression. Ironically, the very concept that the research hinged upon, that interpersonal interaction is a behavior that is missing in depression and is prescriptive for resolving depression symptoms, may have also been the thing that prevented genuinely depressed participants from attending. Researchers may consider future recruitment paradigms where only participants who are already identified as being depressed are targeted for recruitment.

**Inauthentic responses.** Depression scores for the entire sample were low, leaving little room for improvement. The surprising percentage of low scores is inconsistent with what is known about this particular population, and anecdotally, also contradicted what the research assistants noted about the groups. All three of the research assistants who ran

groups remarked that they felt that the PHQ-9s were not completed accurately and did not reflect what participants were reporting in the group. This could mean that participants were underreporting their depression symptoms. One reason for this could be that participants, especially when first joining the group, could have tended to be more guarded and less likely to identify themselves as having any kinds of problems. The assessments were also conducted in the group circle. Even though their scores were not shared in the group, taking the screening in the group setting may have contributed to a dynamic of participants feeling exposed and protective about their experience, leading to some minimization of their symptoms. If this is the case, the improvement in scores could have been even greater than was indicated by the data.

**Impact of a Largely Non-depressed Sample**

The suspiciously low depression rate in the sample begs the question of whether depressed individuals self-select out of the study. A potential bias in recruitment is one probable cause of what emerged in the study as a floor effect, whereby scores were so low initially, that they had little room to improve. Specifically,25 out of 29 participants, or 86.2%, scored a "4" or below on their initial PHQ-9 assessments, a score that would indicate the absence of clinically significant depression symptoms. Therefore, the proposition must be entertained that individuals who were particularly depressed self-selected out of the study, either in the beginning by not consenting to participate, or during the study by not participating once consenting to be involved in the study. Due to the difficulty of engaging depressed individuals into treatment (Warden, et al., 2009), this is a likely explanation.

If these scores are an accurate reflection of participants' depression symptoms, it would mean that only 4 out of 29 participants were experiencing enough symptoms to warrant any intervention. Only one of these four participants was assigned to the wait-listed comparison group and the other three were in the treatment group.

**Impact of treatment for depressed participants.** Of those three in the treatment group who scored a five or above, by the end of the eight week group, two had improved by 4-6 points, putting them into the non-clinical range, and one reported worsening symptoms by 4 points. Also of note, for the one individual in the comparison group who scored in the clinical range, by the end of the eight weeks of receiving only home visiting and no group intervention, her self-reported depression score increased by three points. It is noteworthy that for the three participants in the treatment group that reported any level of clinically significant depression symptoms, 66% improved after the intervention, whereas the one person in the comparison group worsened with no treatment. However, due to the small numbers of participants, this should not be interpreted as a treatment effect.

**Impact of treatment for non-depressed participants.**

***Treatment group.*** For the 12 non-depressed participants in the treatment group, 50% stayed the same, 33.3% improved, and only 16.6% reported worsening symptoms after the eight-week intervention.

***Comparison group.*** In the comparison group, changes in scores looked approximately the same for the 13 non-depressed participants. In this wait-listed group who received only home visiting during the course of the study, approximately 46% (had depression scores that stayed the same, 38% = had depression scores improve, and 15%

had depression scores that worsened over the course of the eight weeks. As noted earlier, the one participant who initially fell within the clinical range for depression reported worse symptoms at the end of the eight weeks.

This implies that there was no real advantage, yet also probably no harm either, in the groups for non-depressed individuals since they were essentially as likely to stay the same, improve or worsen with the treatment as opposed to without. Therefore, according to these results, the treatment groups should probably not even be considered as a preventive measure for postpartum depression for presently non-depressed individuals. However, there could potentially be an advantage for depressed individuals attending the treatment group, with 66% improving and 33% getting worse in the treatment groups as opposed to 100% getting worse in the comparison group. Again, this is based on so few individuals that it should only be considered a speculation warranting further investigation.

## Recommendations for Future Research or Interventions

Two main recommendations emerge as a way to address confounds that may have limited this research study's usefulness and generalizability: recruiting only depressed participants and ensuring consistency across testing procedures.

### Recruiting Only Depressed Participants

In order to determine whether there is any benefit of relationship groups for new mothers with postpartum depression, groups would need to be conducted recruiting only participants who are already experiencing some level of depression symptoms that are clinically significant. As seen in this study, recruiting all new mothers may lead to self-selection bias and is likely to result in mothers who are less depressed volunteering to

participate. This is similar to the challenges that arise for clinicians treating the population with PPD, due to the plethora of issues that arise in engaging new mothers into treatment. As with most treatments, those who need it the most are not always the ones who are willing to receive it. Researchers will need to consider how to motivate and incentivize depressed women with new babies to attend groups. They will also need to take stringent ethical precautions recruiting and treating a sample of participants with documented depression.

### Consistency in Procedures Across Measurement

As seen in the discussion above about the PHQ-9 and TST, variation in the procedures of taking the assessments in the group setting as opposed to the home could have impacted the authenticity and quantity of answers. In retrospect, it would have been prudent to have had both the intervention group and comparison groups complete the first assessments in the home along with the recruitment materials, as this may have made for a more parallel process across groups for recording baseline data. For future studies, researchers might consider the impact of testing in different settings on the assessment outcomes. While the goal of this study was, in fact, to record the impact of involvement in group settings on final outcomes, it was not taken into account that the setting might also impact those first assessments enough to cause a significant difference between groups from the outset that could confound the results.

## Conclusion

People who are depressed are less likely to interact with others socially. Social isolation is a hallmark of depression and is a behavior that has been documented to increase depression symptoms. Cognitive behavioral strategies attempt to address the

dysfunctional behaviors in depression that exacerbate symptoms. Increasing social and interpersonal interactions is often prescribed as a treatment for depression in cognitive behavioral approaches, specifically interpersonal therapy. This prescribed behavior has been found to be therapeutic for depression, and may be particularly helpful for new mothers with depression. However, the tendency for depressed people to avoid social interaction may also be the very thing that makes it difficult to recruit individuals into treatment. For someone who is avoiding socialization, group treatment may seem particularly intimidating. These issues may be compounded when individuals are coping with a variety of life adjustments and stressors related to having a new baby.

The HFNY target population is difficult to engage (DuMont et al., 2006). Persistent outreach efforts are required to draw participants into the program. In this study, targeting the same population, participants who could potentially benefit the most from a relationship group seemed the least likely to attend.

While it is not possible to draw any definitive conclusions from this study about the full impact of treatment for depressed individuals, it is hopeful that for the three individuals in the treatment group with mild depression symptoms, two of the three reported improvement after participation in the intervention while the one individual in the comparison group who was initially depressed worsened. Although extreme caution is warranted due to the small number of participants, it is still worth remarking that two out of three participants with clinically notable depression symptoms should show improvement. Only a study employing this paradigm with a much larger number of clinically depressed individuals would be able to determine whether this outcome would persevere in a larger sample. Such a design would also reveal whether improvement

would be observed for those with more severe depression symptomatology.

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