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## Lasting effects of an interdisciplinary home visiting program on child behavior: Preliminary follow-up results of a randomized trial

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### Introduction

Mental health problems are estimated to affect one in five children (National Center for Chronic Disease Prevention, 2009). These problems create great vulnerability in families, increase costs to society, and are major nursing and public health concerns. Common mental health problems among children fall into two broad categories: internalizing (anxiety and depression) and externalizing behavior problems (aggression, destructive, and delinquent behavior) (National Center for Chronic Disease Prevention, 2009). Reports from randomized controlled trials (RCT) suggest that parents who participate in parenting programs designed to increase their parenting skills report a reduction in their children's behavior problems (Gardner, Burton, & Klimes, 2006); however, the mechanism underlying the relationship between children's reduced behavior problems and participation with parenting programs is poorly understood.

Parenting programs may be particularly important for families struggling with poverty and other forms of disadvantage, as children growing up in these environments are more likely to develop problem behaviors - such as aggression, attention problems, or delinquency (Lyons-Ruth, Alpern, & Repacholi, 1993; Smeekens, Riksen-Walraven, & Van Bakel, 2007). Child poverty rates have increased steadily in the United States over the past decade. From 2000 to 2010, the rate of child poverty increased from 15.6 to nearly 22 percent with the most notable increases occurring after 2006 (Redd, Karver, Murphey, Moore, & Knewstubb, 2011). Poverty is one of the toxic stressors that negatively affect children's development as addressed in a recent American Academy of Pediatrics policy statement (Garner et al., 2012). Research suggests that well designed and implemented programs

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involving parental effort and social programs can improve the lives of children and their families, particularly those with fewer resources (Moore, Redd, Burkhauser, Mbwana, & Collins, 2009). This study was designed as a pilot study to examine the intermediate effects of one such program, *Minding the Baby*® (MTB), on child behavior 1–3 years post-intervention.

### Reflective Functioning

Parental reflective functioning (RF) is defined as a parent's capacity to envision the mental states of herself and her child (Slade, 2005) and refers to the awareness that an individual's behavior is a reflection of mental states (thoughts, feelings, intentions, desires) (Ordway, Sadler, Dixon, & Slade, in review; Slade, 2002). According to Fonagy and colleagues (2002), one's capacity for RF is central to self-organization and affect regulation. They further suggest that the quality of a person's RF capacity is a result of early social relationships in life (Bateman & Fonagy, 2012). Parents who are able to use parental RF are not simply reacting to their infant's or child's behavior, rather they are understanding the mental states that underlie the behavior; therefore they respond to the child's emotions, needs, and desires (i.e. the child's mental states) in a reflective manner (Slade, 2005). To date, while there are studies linking parental RF with infant attachment (Slade, Grienberger, Bernbach, Levy, & Locker, 2005), no studies have examined the potential role of RF as a mediator of the relationship between parenting and child behavior.

### Effects of Home Visiting Programs

One important focus for the prevention of adverse child behaviors such as aggression and disruptive behaviors is fostering and supporting early parent-child interactions and attachment (Lyons-Ruth & Melnick, 2004). That is the focus of many home visiting programs working with new parents. To date, relatively few home visiting programs described in the literature have reported significant longitudinal effects (Howard & Brooks-Gunn, 2009; Paulsell, Avellar, Martin, & Grosso, 2010) and among those with reported results, home-visiting programs delivered by nurses demonstrate the strongest results (Eckenrode J & et al., 2010; Olds, Sadler, & Kitzman, 2007). This pilot study is the first follow-up study of the *Minding the Baby*® MTB home visiting program, which is unique from other programs in that it incorporates an interdisciplinary team focused on the enhancement of parental RF rather than teaching specific parental skills (Sadler, Slade, & Mayes, 2007; Sadler, Slade, & Mayes, 2006; Slade, Sadler, Dios-Kenn, et al., 2005; Slade, Sadler, & Mayes, 2005).

### *Minding the Baby*® (MTB)

The MTB home visiting program focuses on young first-time new parents, primarily mothers, who are at high risk due to multiple complex issues, including young maternal age, poverty, and history of trauma that often render them unable to identify or use clinical or other community-based resources (Sadler et al., 2006; Sadler et al., under review, November 2012). An interdisciplinary team of a pediatric nurse practitioner and clinical social worker provide weekly individual home visits to first time mothers beginning prenatally until their children are 2 years old (Sadler et al., 2006). The MTB home visiting program was designed as a preventative program to enhance parental RF and the development of secure attachment of the infant (and subsequent children), as well as to address maternal health and mental health issues and thereby short circuit some of the child and family mental health problems that begin early in life. The MTB program is rooted in the public health concerns surrounding the vulnerability of young parents and their children - living within under-resourced communities, with a particular focus on bringing maternal physical and mental health as well as infant mental health clinical care into the home setting. Findings from the

original pilot study of the 27 month intervention indicate more securely attached infants and fewer infants with disorganized attachment, as well as less rapid subsequent child-bearing and less child maltreatment in families who received the MTB program when compared with control group families who have received routine health care. While a larger randomized clinical trial is still underway, it was important to begin to examine longitudinal effects from the initial cohort of families. The purpose of this current pilot study was to evaluate the intermediate effects (1–3 years post intervention) of the MTB program on child behaviors and parental reflective functioning (RF). We hypothesized that mothers who participated in the MTB intervention would report lower levels of child behavior problems and have increased capacity for parental RF compared to the control group. If intervention mothers were to report lower levels of child behavior problems, our secondary hypothesis was that parental RF would mediate this relationship.

## Methods

### Design

This pilot study is a prospective longitudinal follow-up study of the MTB home visiting program. In the original design, the MTB primary study used a nested two group experimental design with random assignment of prenatal care groups at a community health center to test the effects of the MTB program with young families (Sadler et al., under review, November 2012). The hypotheses for this follow up study were tested through analyses of data previously collected during the MTB primary study and additional data collected 1–3 years post-intervention during this follow-up study.

### Study Participants

At the start of this follow-up study, there were 132 mother-child dyads that previously participated or were presently participating with the MTB program. Mother-child dyads were eligible for this study if they met the following criteria: (a) the targeted child was between the ages of 3 to 5 years old at the time of data collection between March 2010 through March 2011, (b) the mother had primary custody or regular visitation with the child, (c) the dyad lived in state and/or was able to meet in state for the data collection, (d) the mother participated in the MTB program or the control condition beyond the initial consent period. Among the 71 mother-child dyads with children 3–5 years old during the one-year data collection period, 62 met all of the eligibility criteria. Fifty dyads (80.6%) were available for contact and twelve dyads were unreachable. None of the mothers who were contacted refused to participate in the follow up study (Figure 1).

Upon IRB approval from the University and local community health center where the women were originally recruited, subjects were consented and data were collected during two data collection visits with the mother-child dyads. The sample size was calculated using nQuery and the test significance level was chosen to be  $\alpha=.05$  and 80% power was selected for analyses of two outcomes, parental RF and child behavior. Accordingly, the required size for each group was determined to be 17 dyads. All of the eligible subjects were recruited thereby resulting in the enrollment of 29% more subjects from each group allowing for study attrition.

### Measures

**Demographic variables**—Maternal and child demographic data collected included age, education status, ethnicity, maternal marital status, father involvement, and health status.

**Parental reflective functioning**—Parental RF was assessed on three occasions, twice during the primary study and once during the follow-up study. The Pregnancy Interview was

conducted with the mothers prenatally and the Parent Development Interview was conducted with the mothers when the children were 2 years old and again when they were 3–5 years old.

**Pregnancy Interview (PI):** The Pregnancy Interview (PI) is a semi-structured clinical interview with 22 questions. The PI was administered to all participants during the third trimester of pregnancy as part of the primary MTB study. The interview assessed the mother's emotional experience during pregnancy as well as her expectations and fantasies regarding her future relationship with her child. Examples of the questions asked in the interview include: "What are some of the good feelings you've had during your pregnancy?" "Have you had any hard or difficult feelings during your pregnancy?" and "Take a minute to imagine your child in the future. What kind of person do you imagine your baby's going to be? What's the idea or picture that comes to mind?" Parental RF is scored on an eleven point scale (-1 to +9) with higher scores reflecting higher levels of parental RF (Slade, Bernbach, Grienberger, Levy, & Locker, 2005). The scoring system assesses three principal areas of interest: the mother's developing representations of her baby, her parental representations, and her state of mind (Slade, Patterson, & Miller, 2007). Interviews were transcribed verbatim and scored for parental RF by trained coders in the primary study. Reliability testing for the PI coding is similar to PDI (see below).

**Parent Development Interview (PDI):** Upon completion of the primary MTB study (when the child was 2 years old), each mother was interviewed with the Parent Development Interview-Revised Short Form (PDI-RS), revised (Slade, Aber, Berger, Bresgi, & Kaplan, 2003). The PDI was repeated during the current follow-up study, which allowed for comparison of maternal RF scores at child age 2 years and child age 3–5 years. The PDI format is a 20-item semi-structured interview that assesses the mother's representations of her relationship with her child. The interview takes about 45–60 minutes to complete. Examples of questions asked include: "Describe a time in the last week when you and (your child) really 'clicked'." "When does your child need attention from you?" and "Now, I'd like you to think of a time you and your child weren't together, when you were separated. Can you describe it to me?" Interviews were transcribed verbatim and scored for RF by trained coders blinded to the group status of the mother. Studies assessing the validity of this measure have demonstrated links with adult attachment, child attachment, and parental behavior both in normal and drug using samples (Aber, Belsky, Slade, & Crnic, 1999; Slade, Belsky, Aber, & Phelps, 1999; Slade, Bernbach, et al., 2005; Truman, Levy, Mayes, & Slade, 2002). Average scores on normative samples of mothers are 6, where the scores from mothers living in poverty settings range between 1–6, with a mean of 4 (Grienberger, Kelly, & Slade, 2005; Levy, Truman, & Mayes, 2001; Slade, Grienberger, et al., 2005). In all studies, intraclass correlation scoring reliabilities above .80 have been regularly achieved (Aber et al., 1999; Grienberger et al., 2005; Slade et al., 1999; Slade, Bernbach, et al., 2005).

**Maternal depressive symptoms—**The Center for Epidemiological Studies Depression Scale (CES-D) (Comstock & Heising, 1976; Radloff, 1977) is a brief 20 item measure of self-reported depressive symptoms. Each item is rated on a scale from 0 to 3 in terms of frequency of occurrence during the past week. The total score may range from 0 to 60, with a score of 16 or more indicating impairment. The CES-D has high internal consistency reliability, acceptable test-retest stability, and construct validity in clinical and community samples including urban adolescents and adolescent mothers (alphas = 0.85–0.83) (Lesser & Koniak-Griffin, 2000; Wilcox, Field, Prodromidis, & Scafidi, 1998). For this current study, the Cronbach's alpha coefficient was computed to be 0.76.

**Internalizing and externalizing behaviors (parent report)**—The Child Behavior Checklist (CBCL/1.5–5) is a parent questionnaire for children ages 18 months through 5 years that contains 99 questions, as well as three open-ended questions for parents to describe additional behaviors of concern. The instrument has a reading level of grade five. Parents are asked to report on various behaviors on a 3 point scale from not true, often true, and very true. There are two scales within the CBCL: “Internalizing” problems (36 items) and “Externalizing” problems (24 items). The total score and two subscales were used in analyses. The CBCL was found to be largely equivalent across African American, Latino, and non-Latino White parent informants across income levels with reliability ranging from 0.77–0.91 (Gross, Fogg, & Young, 2006). Cronbach’s alphas for this study were calculated to be 0.90 for the Externalizing subscale, 0.82 for the Internalizing subscale, and 0.94 for the Total Problems scale.

**Internalizing and externalizing behaviors (Caregiver-Teacher Report Form C-TRF)**—The CBCL was designed as a multi-informant system to best assess the true behavior of the child with as little bias as possible. The Caregiver-Teacher Report Form (C-TRF) offers another source of information for comparison with the parents’ report of their child’s behavior. Literature suggests that researchers should incorporate validated criterion raters who are not influenced by the potential bias related to a mother’s depression, since maternal depression has been well documented as an influence on reporting of children’s behaviors (Ordway, 2011; Richters, 1992). During the first research session, the mothers were asked to distribute two C-TRF forms from the CBCL/1.5–5 to other caregivers or teachers involved in the child’s care as criterion raters of the child’s behavior.

## Data Management and Analysis

The analytic aims of this initial follow up study were twofold. The first was to investigate the differences in reported child behavior problems between the intervention and control groups who previously participated in the MTB program. The second analytic aim was to examine the longitudinal patterns of parental RF in this cohort, and the possible mediating effect of parental RF on the relationship between groups and maternally reported child behavior problems. Survey data were double entered into two MSAccess data bases. Data were compared, cleaned and then imported into SPSS (v17.0) for analyses. Data (RF data from pregnancy and when the child was 24 months) from the original MTB study were used in analyses of the aim to examine the longitudinal patterns on parental RF. Each variable was described with frequency distributions and appropriate summary statistics for central tendency and variability. These univariate analyses assessed assumptions, such as normality, underlying the statistical tests used in the analysis. Comparison of demographic characteristics between the intervention and control group tested equivalence between groups in this current follow-up study cohort. Covariates were determined and included in analyses.

## Results

### Descriptive Findings

The intervention and control group mothers who participated in this follow-up study of the MTB home visiting intervention were similar with regard to most background demographic characteristics (Tables 1 and 2). In this cohort, 25 (11 intervention and 14 control) of the mothers were teenagers (less than 20 years old) at the time of their child’s birth, which was not a statistically significant difference between the two groups. Among the children, there was not a significant difference found between groups with respect to gender.

Significant difference was found on two demographic variables. A total of 22 (91.7%) of the intervention mothers were Latina while only 13 (50%) of the control mothers were Latina; a statistically significant ( $\chi^2 = 10.32, p=.001$ ) demographic variable which was included in analyses as a covariate. The control group was significantly ( $t = -2.64, p = .012$ ) more educated than the intervention group ( $15 \pm 1.63$  years of education versus  $13.3 \pm 2.76$  years respectively). Maternal education was included as a second covariate in analyses.

**Maternal depressive symptoms**—The CES-D was used to measure maternal depressive symptoms. The means for each group are displayed in Table 3. The mean depressive symptoms score for both groups was below the cut-off for clinically significant levels and did not differ statistically between groups (controlling for maternal education and ethnicity). Based on the cutoff of 16, there were four women in each group with self-reported depressive symptoms in the clinically significant range.

**Parental reflective functioning**—The mean scores for parental RF at the end of the primary study and during this current follow-up study demonstrated that, on average, while the control group in this sample had higher parental RF mean scores, the intervention group's parental RF mean scores increased over time (3.31 increased to 3.63) while the control group's mean parental RF scores decreased over time (3.95 decreased to 3.79). The means for each group are displayed in Table 3. Paired t-test analyses revealed that the changes over time within the 2 groups were not statistically significant.

**Child behavior**—Child behavior was measured using the maternally reported internalizing, externalizing, and total behaviors subscales of the Child Behavior Checklist/1.5–5 (CBCL/1.5–5). The means and standard deviations are displayed in Table 3. The data were normally distributed and analyses were completed using the *T*-scores of the Internalizing, Externalizing, and Total Problem behavior composite scales. The borderline range for the scales is between 60 through 63, while scores greater than or equal to 64 are in the clinically significant range. The control group mothers reported higher levels of child behavior problems on all three composite scales compared to the intervention mother reports of their children.

**Caregiver-Teacher Report Forms (C-TRF):** Since more than 40% of the data were missing from the C-TRF forms due to failure of the mothers to return the forms to the investigator, the comparison analyses with criterion raters were only descriptive in nature. All women were provided two C-TRF forms and among the twenty-seven mothers who returned the C-TRF, only fifteen returned two C-TRF forms. The mean scores of the C-TRF can be found in Table 3. The mean scores from the mothers and caregiver/teacher on reports of externalizing child behaviors were significantly different, with teacher and caregiver reports denoting higher levels of externalizing problem behaviors than maternal reports in both groups ( $t_{intervention}=12.22, p=.000, n=11; t_{control}=15.11, p=.000, n=16$ ).

### The Effect of MTB on Child Behavior

Analysis of covariance (ANCOVA) was completed to compare the differences between the control and intervention groups with respect to maternally reported child behavior outcomes. Since two covariates significantly differentiated the two groups, maternal education and Latina ethnicity were included as covariates in the analyses. The homogeneity of regression assumption was tested by evaluating the interaction of the covariates (Latino and highest grade) and the independent variable (group status) in the prediction of the dependent variables (child behavior). The results were not significant and therefore the assumption was not violated. Unequal sample sizes between the control ( $n=26$ ) and intervention ( $n=24$ ) groups required the use of Type III sums of squares. Three separate sets of analyses were

completed using each of the three child behavior composite scales: internalizing behaviors, externalizing behaviors, and total problem behaviors. The ANCOVA was significant between group status and externalizing behaviors with a large effect size ( $F=9.14$ ,  $p=.004$ ,  $\eta^2=0.166$ ) (Table 4). According to Cohen (1988), convention for behavioral work suggests  $\eta^2=0.010$  as a small effect size,  $\eta^2=0.059$  as a medium effect size, and  $\eta^2=0.138$  as a large effect size. The ANCOVA was not statistically significant between group status and total problems behaviors; however, there was a medium effect size ( $F=3.12$ ,  $p=.084$ ,  $\eta^2=0.06$ ). There was no statistically significant difference between group status and internalizing behaviors. Because of potential gender differences in child behavior patterns, gender was evaluated with respect to externalizing behaviors; there was no significant relationship within either group.

### Reflective Functioning Among MTB Mothers

Repeated measures using generalized estimating equations (GEE) were used to examine the stability of RF over time after the intervention was completed. A challenge to statistical analysis of longitudinal data is the fact that repeated observations for a subject tend to be correlated (Liang & Zeger, 1986). In order to examine the group by time difference with respect to parental RF, a multiple linear regression model fit by a generalized estimate equation (GEE) using exchangeable correlation and Bonferroni adjustments was created (Table 5). Additional challenges to this analysis were the incomplete data on parental RF from the primary study among the cohort included in this current study and the non-normal distribution of the PDI, both of which also required the use of the GEE method (McCulloch & Neuhaus, 2005). Covariates in the model included maternal education, Latina ethnicity and parental RF scores that had been collected and coded for study participants prenatally during the primary study. Parental RF measured during the women's pregnancy significantly predicted the parental RF when the children were 2 years to 3–5 years old (Wald  $\chi^2=18.386$ , Wald CI [0.540–1.352],  $p<.001$ ). These results indicate that higher parental RF levels during pregnancy predicted higher levels of parental RF when the children were 2 years old and again at 3–5 years old, taking into account time. Maternal education also significantly predicted the change in RF ( $\chi^2=8.594$ , Wald CI [0.053–0.265],  $p=.003$ ). Latina ethnicity and group status did not contribute significantly to the model. The group by time difference was not statistically significant but the analysis showed a trend in group status predicting parental RF over time from the end of the intervention to the time of this follow-up study, 1–3 years later ( $\chi^2=2.986$ , Wald CI [–1.195–0.075],  $p=.084$ ).

### Mediating Effects of Parental RF

Once it was determined that there was a significant difference between the control and intervention groups with respect to externalizing child behaviors, a series of regression analyses (Baron & Kenny, 1986) were conducted in order to examine the potential for parental RF to mediate this relationship in the presence of the covariate variables maternal education and Latina ethnicity. Group status was not found to be significantly related to parental RF ( $\beta = -0.123$ ,  $p = .71$ ) so that among this sample of dyads, parental RF did not appear to mediate the relationship between group status and child behavior.

### Discussion

The purpose of this pilot study was to examine the intermediate effects of the MTB on child behavior and parental RF. This was the first follow-up study of the MTB program and therefore potential challenges to the re-recruitment of the mother-child dyads and selection of outcome measures had not previously been examined. Overall the study was successful in locating the mother-child dyads. The choice of child behavior measures was effective for use with the mothers, but not as effective when we attempted to collect data from criterion

raters. A major finding in this follow-up study is that after 1–3 years the mothers who participated in the MTB intervention reported significantly fewer externalizing behaviors in their children than mothers in the control group. The following discussion highlights the clinical importance of these findings and offers suggestions for further analyses. Limitations of the study are also presented.

### Child Behavior Outcomes

There was a large effect size when the difference between the intervention and control groups was examined with respect to maternally reported externalizing behavior problems in their children. It is important to note that at the time of this follow-up study, the women who were in the MTB group had significantly fewer years of education, and in addition, while not statistically significant, they also reported higher levels of depressive symptoms and less involvement with their child's father. Despite these vulnerabilities, the intervention mothers reported significantly fewer externalizing behaviors in their children. They also reported somewhat fewer internalizing and total problem behaviors, although these results were not statistically significant.

Although we successfully collected data from the mothers' reports of their children's behaviors, the collection of the C-TRF was impeded as a result of the poor return rate of the forms. During the first data collection visit, we asked the mothers to distribute and collect the C-TRF to a teacher or other caregiver (a criterion rater). We received only a little more than half of the forms at the second data collection visit. Among the mother-child dyads who returned the C-TRF, there was a trend indicating that the criterion raters also rated the control group children's behavior as more problematic. Future follow-up study methods should include consent procedures to allow the researchers to collect data directly from the criterion raters.

The results from this modest sample indicate that the MTB program may be contributing to improved child behavioral outcomes 1 to 3 years after the MTB intervention was completed. Externalizing behavior problems are outward behaviors such as aggression and attention problems, and children who exhibit these behaviors are more likely to be bullied by their peers, to be socially rejected, and to have poorer academic performance (McClain et al., 2010; Wood, Cowan, & Baker, 2002). Furthermore, externalizing behavior problems at age four and five have been associated with sexual risk taking and drug abuse behaviors during adolescence (Timmermans, van Lier, & Koot, 2008). The clinical importance of fewer maternal reports of externalizing behaviors within the MTB children lends support to parenting programs, such as MTB, which focus on improving parent-child relationships and the parent's capacity to understand the child's emotions, intentions and needs. The prevention of child externalizing behaviors in the pre-school years may help to reduce the known cascading effects of these early behavior problems later in life.

### Parental RF

We hypothesized that the intervention group mothers would have increased capacity for parental RF during the follow-up period. Unexpectedly, this cohort of intervention mothers in the subsample of the MTB study had lower mean parental RF levels as compared to the control group mothers when RF was measured at the completion of the primary study. However, a promising association emerged from these data as the parental RF levels of the intervention mothers increased from when RF was measured at the end of the intervention (child age of 24 months) to the time of this current study, whereas the control group mothers had decreased parental RF levels over this same time period. While this change was not statistically significant, it will be important to continue to study this relationship over time and with larger sample sizes. The finding that this cohort of control group women from the



primary study had higher parental RF scores at the end of the primary study was unexpected and thought to be possibly related to demographic or other variables. A significant correlation was found between higher education levels and parental RF and notably, the control group had a significantly higher level of education. While maternal education was controlled for in this study, future follow-up studies may examine the potential effect of the continuation of maternal education among these young mothers on their development of maternal RF.

Parental RF has been associated with improving the emotional quality of the parent-child relationship through the development of maternal sensitivity to children's emotional needs (Suchman, Mayes, Conti, Slade, & Rounsaville, 2004) and was therefore hypothesized to mediate the relationship between parenting and child behavior among those who participated in the MTB program. Surprisingly, there was no direct or mediating relationship found to exist between parental RF and child behaviors in this cohort. One possible explanation for this unexpected finding may be that parental RF among high risk mothers is a complex construct that is difficult to measure. The mean scores of RF levels were quite low ( $3.63 \pm 1.00$  for intervention group and  $3.79 \pm 1.07$  for control group). These levels fall below the average score of 4 (indicating rudimentary or low parental RF), commonly reported in samples of mothers living in poverty environments (Grienberger et al., 2005; Levy et al., 2001; Slade, Grienberger, et al., 2005).

It is possible that there are specific components of parental RF influencing child behaviors and these components need to be separated from global parental RF conceptualization and measurement. Parental RF requires that parents accurately mentalize about the thoughts, feelings and emotions of three separate minds: their minds, their children's minds, and their own parents' minds. Suchman and colleagues (2010) used principal components analysis to examine the PDI as measuring two components of RF: self-focused RF and child-focused RF. This approach may help to evaluate the unique components of parental RF as they may specifically influence parenting and child behavior. A larger sample size would allow for analysis of the components of RF as potential mediators of the relationship between the intervention and reported child behavior outcomes.

## Limitations

A limitation of this study was the small sample size. While it was well powered to detect differences in the effect of the intervention on child behaviors, the sample size was relatively small for mediation analyses. In addition to the small sample size, it should be noted that nearly 20% of the sixty-two eligible participants were not reachable. This may reflect sample selection bias, and thus a potential threat to the internal validity of the study. There were four missing control group mothers and eight missing intervention group mothers. Among the 12 missing subjects, there was no statistical difference in maternal age between the groups nor was there a difference in age between the missing subjects and enrolled subjects. The missing subjects were less educated than the enrolled subjects and the difference between the intervention and control group mothers who were missing from this study remained with the control reporting a higher education level compared to the intervention group.

This study was designed to be the first follow-up study of the MTB RCT program. Child behaviors had not yet been measured as part of the original study and the investigators were curious about child behaviors outcomes beyond their toddler years. Results from the CBCL indicate that among this cohort of dyads, the children were generally normative with respect to their behavior. This information, combined with the findings related to the longitudinal measures of parental RF provides important information for the investigators to consider in future development and evaluation of the MTB program. Due to the high rates of reported

traumatic events among the mothers who participated with the MTB program (Sadler et al., 2006), further evaluation of the mother's trauma history at the time of the follow-up should be included in future studies.

### Clinical Implications

Clinically, this study adds support to the view of preventative home visiting programs for parents as a method of reducing externalizing behavior problems in children. The prevention of children's externalizing behaviors in the preschool years may help to reduce further effects later in their lives. Within clinical settings, parents commonly approach their children's clinicians with questions about child behavior. The behaviors in question are often the result of the children's affect dysregulation and parents commonly search for answers about "what to do" about these troubling behaviors. A more contemporary view of infant mental health risk, psychopathology, and intervention involves a relational approach that requires a clinician to view the parent-child *relationship* as the patient. This relational approach is one of the unique aspects of the MTB home visiting program.

### Program and Policy Implications

Preliminary evidence from the current study that mothers who participated in the MTB program had children with fewer externalizing behavioral problems adds to the growing evidence for the benefit of home visiting programs for vulnerable young families. Future examination of the measurement and evaluation of parental RF as well as other potential "active ingredients" of home visiting parent support programs may provide further insight into the relationship between early parenting and child health and behavioral outcomes.

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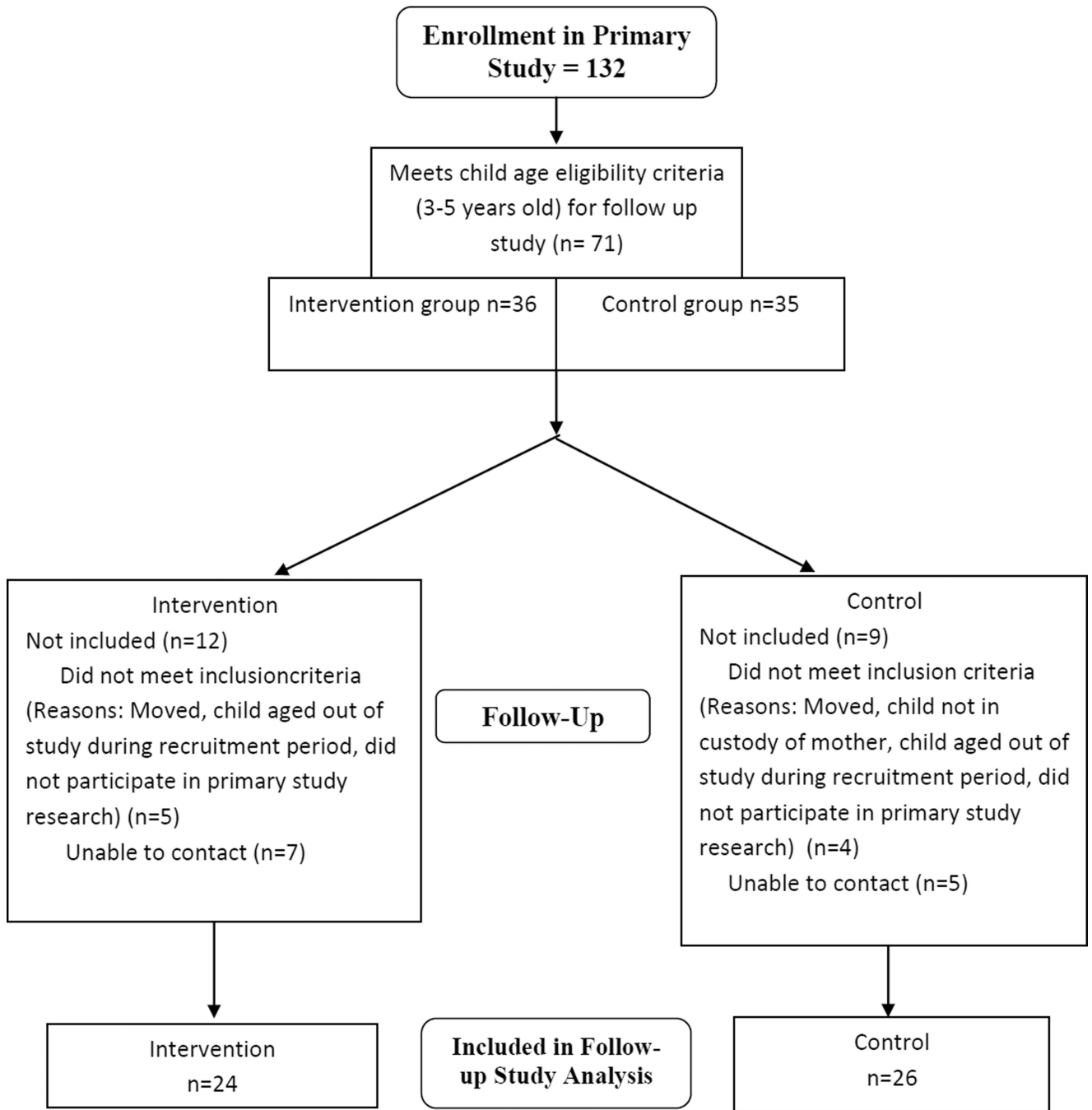
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**Figure 1. CONSORT Flow Diagram**  
Flow of participants from original study through follow-up.

**Table 1**

Descriptive Demographic Statistics: Mean (SD)

Variable	Intervention Group (N=24)	Control Group (N=26)
<b>Demographic characteristics</b>		
<b>Maternal age at follow-up</b>	24.5 (3.04)	24.3 (2.96)
<b>Highest grade completed *</b>	13.3 (2.76)	15 (1.63)
<b>Age of child in months at follow-up</b>	51.8 (9.89)	48.6 (13.04)
<b>Dose of Intervention (total number of visits)</b>	68.4 (37.55)	N/A

\* Independent t-test  $p = .05$

**Table 2**

## Demographic Variables: Frequencies (Percent)

Variable	Intervention Group (N=24) N(%)	Control Group (N=26) N(%)
Latina *		
Yes	22 (91.7)	13 (50)
No	2 (8.3)	13 (50)
Sex of Child		
Female	12 (50)	10 (38.5)
Male	12 (50)	16 (61.5)
Race		
White	15 (62.5)	14 (53.8)
Black or African American	5 (20.8)	11 (42.3)
Native Hawaiian/Pacific Islander	1 (4.2)	0
Other	3 (12.5)	1 (3.8)
Marital Status		
Single, never married	17 (70.8)	19 (73.1)
Married	1 (4.2)	3 (11.5)
Divorced/Separated	2 (8.3)	0
Engaged	4 (16.7)	4 (15.4)
Father involvement		
Very involved	8 (33.3)	14 (53.8)
Somewhat involved	9 (37.5)	9 (34.6)
Not involved	7 (29.2)	3 (11.5)

Statistical difference between groups based on:

\* chi-square  $p = .05$

**Table 3**

Unadjusted Descriptive Statistics for Study Variables: Mean (SD)

Measures	Intervention Group	N	Control Group	N
<b>Maternal depressive symptoms (CESD)</b>				
At end of intervention	11.7 (7.90)	24	8.4 (4.85)	26
At follow up	8.9 (5.62)	24	8.9 (5.84)	26
<b>Parental reflective functioning</b>				
Prenatally (PI)	3.2 (.49)	23	2.9 (.55)	25
At end of intervention (PDI)	3.3 (.75)	18	3.95 (1.64)	20
At follow up (PDI)	3.6 (1.00)	24	3.8 (1.07)	26
<b>Child's internalizing behaviors</b>				
CBCL 1.5-5	44.5 (10.31)	24	48.1 (10.16)	26
C-TRF1*	43.4 (9.615)	11	48.4 (9.158)	16
C-TRF2*	43.0 (12.884)	9	44.2 (8.786)	9
<b>Child's externalizing behaviors</b>				
CBCL 1.5-5	41.4 (7.62)	24	48.2 (7.40)	26
C-TRF1*	48.3 (12.705)	11	52.1 (9.959)	16
C-TRF2*	43.2 (7.757)	9	46.9 (7.607)	9
<b>Child's total problems</b>				
CBCL 1.5-5	42.5 (9.24)	24	47.6 (9.70)	26
C-TRF1*	45.1 (14.883)	11	51.3 (9.471)	16
C-TRF2*	40.3 (12.644)	9	45.6 (7.907)	9

\* Note: C-TRF1 is the mean of the C-TRF forms completed by the first chosen criterion reporter (teacher, daycare provider, or other family member) and returned by the mother and C-TRF2 is the mean of the C-TRF forms completed by the second chosen criterion reporter and returned by the mother. Not all mothers returned the forms and fewer returned two completed forms.



**Table 4**

Group Differences with Respect to Externalizing Behaviors on the CBCL/1.5-5

Source	SS	Df	MS	F	P	$\eta^2$
Latina	.426	1	.426	.007	.932	.000
Maternal Education	39.929	1	39.929	.689	.411	.015
Group Status	529.325	1	529.325	9.138	.004	.166
Error	2664.624	46	57.927			
Total	104273.000	50				

**Table 5**

GEE Group by Time Differences in Parental RF, Controlling for Parental RF during Pregnancy (PI), Latina Ethnicity of the Mother and Maternal Education

Characteristic	B (SE B)	Wald $\chi^2$	Wald 95% Confidence Interval	p-Value
PI	.928 (.216)	18.386	.504–1.352	.000
Latina	-.002 (.338)	.000	-.664-.659	.995
Maternal Education	.159 (.054)	8.594	.053-.265	.003
Group Status	-.146 (.294)	.247	-.722-.430	.619
Time	.228 (.272)	.703	-.305-.761	.402
Group Status by Time	-.560 (.324)	2.986	-1.195-.075	.084