

# A Pilot Randomized Trial of Community-Based Parent Training for Immigrant Latina Mothers

Ariel A. Williamson · Lyndee Knox ·  
Nancy G. Guerra · Kirk R. Williams

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**Abstract** This paper reports on the development and piloting of the *Madres a Madres* (Mothers to Mothers) program, a new, community-based parent training program designed for immigrant Latina mothers and their children. *Promotoras*, or female community health workers of Latina background, delivered the program in a home visitation format. A total of 194 mothers and 194 focal children (87 male, 107 female) ages 7–12 were randomized to the intervention (113 mother–child dyads) or wait-list control condition (81 mother–child dyads) over the study period. Outcomes of interest were mother-reported parenting skills, broad family functioning, and child externalizing and internalizing behaviors. Data collection occurred at pretest, 3-month posttest, and 9-month follow-up periods. Multilevel growth models revealed increases in intervention mothers' reported parenting skills, family support, and family organization, and reductions in child internalizing behavior from pretest to follow-up, relative to the control condition. Outcomes did not vary by focal child age, gender, nativity status, or mother acculturative status (years in the United States). Findings are discussed in the context of future directions for research on the *Madres a Madres* program and on the implementation and dissemination of empirically-supported parent training practices to culturally diverse families.

**Keywords** Community health workers · Cultural adaptation · Home visitation · Latinos · Parent training · Prevention

## Introduction

This paper describes the development and pilot evaluation of *Madres a Madres* (Mothers to Mothers), a newly developed parent training program for immigrant Latina mothers and their elementary school-aged children. *Madres a Madres* evolved as part of a multi-year collaboration between a community-based agency, Latino Health Access (LHA), and the university-based Academic Center of Excellence on Youth Violence Prevention (ACE). This partnership emphasized the prevention of child behavior problems, including aggression and violence, through family-based interventions. The first phase of this partnership involved a randomized controlled trial of Families and Schools Together (FAST), a program with strong prior empirical support and some evidence with Latino families. However, the FAST program yielded minimal effects on parents and children in the immigrant Latino sample (Knox et al. 2011). In qualitative and process data from the FAST trial, parents stated that they needed more specific information on parenting skills, and discussed several unique challenges they faced that were not addressed by FAST. These included parent–child acculturative gaps, family power structure reversals, linguistic barriers, overcrowded housing, and unfamiliarity with US school and welfare systems. Families also had difficulty traveling to the intervention site, and the cost to LHA of sustaining the program beyond project funding was prohibitive (Guerra and Knox 2008).

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A. A. Williamson (✉) · N. G. Guerra  
Department of Psychology, University of Delaware, 108 Wolf  
Hall, Newark, DE 19716, USA  
e-mail: awilliamson@psych.udel.edu

L. Knox  
L.A. Net, Long Beach, CA 90803, USA

K. R. Williams  
Department of Sociology and Criminal Justice, University of  
Delaware, 322 Smith Hall, Newark, DE 19716, USA

The second phase of the LHA-ACE partnership involved developing and piloting a parent training program that could respond to the programmatic needs and implementation concerns of immigrant Latino families. We first looked to the literature on empirically-supported treatment (ESTs) for parent training (Eyberg et al. 2008) to determine whether there were existing ESTs that would be relevant to the cultural and contextual concerns of Latino families (Lau 2006). We found that a number of parent training programs with “surface structure” adaptations, such as translation to Spanish, had been evaluated on samples with Latino participants. For instance, several studies on the Incredible Years (IY) program that involved adaptations like video segments and materials in Spanish have shown positive outcomes, including positive treatment effects, no differential attrition, and high satisfaction among Latino families (Barrera et al. 2002; Linares et al. 2006; Reid et al. 2001). However, the intervention itself was not modified to address specific cultural or contextual needs that are relevant for new immigrant families.

This type of adaptation involves changes in “deep structure” program characteristics to maximize alignment with the target group’s cultural values and ecological setting (Castro et al. 2004; Lau 2006; Leidy et al. 2010a). This work has been done to some extent with ESTs like Parent–Child Interaction Therapy (PCIT) and Parent Management Training—Oregon Model (PMTO). Relevant adaptations have focused on integrating Latino cultural values like *familismo* (the importance of familial obligation, support, and authority) and *personalismo* (the importance of reciprocal interpersonal relationships; Leidy et al. 2010a), or reducing the stigma associated with mental health services for Latinos by calling therapists “teachers” or “coaches,” for example (Martinez and Eddy 2005; McCabe and Yeh 2009). In some cases, specific behavioral strategies included in these programs were modified further to increase consistency with Latino families’ parenting beliefs (Matos et al. 2009; McCabe and Yeh 2009). Evaluations of these adapted programs have generally shown positive effects on parenting and child behavior in Latino samples. Unfortunately, few programs have specifically targeted immigrant Latino families, although an adapted version of PMTO included a module on parent–child acculturative differences. However, the program was less effective among immigrant Latino youth (Martinez and Eddy 2005).

It is likely that broadly cast adaptations targeting Latino cultural values do not sufficiently capture the unique contextual stressors of recent immigrant populations. Research has shown that in addition to the parenting stressors of parent–child acculturative gaps, familial role reversals, and language barriers, recent immigrant families must also contend with contextual stressors like living in high poverty and high violence neighborhoods, overcrowded

housing, a lack of insurance for and access to healthcare, unfamiliarity with US social services, and fear of Immigration Control and Enforcement raids and deportation (Baumann et al. 2011; Guerra and Knox 2008; Knox et al. 2011; Parra Cardona et al. 2008). These unique stressors were clearly expressed by the immigrant Latino participants in our initial FAST trial, and may impact both the applicability and generalizability of available parent training ESTs to this population.

These parenting and contextual concerns are not comprehensively addressed in any of the available evidence-based parent training programs, although some programs are moving in this direction. For example, an adapted version of PMTO called *Criando con Amor: Promoviendo Armonía y Superación* (CAPAS; Raising Children with Love, Promoting Harmony, and Self-Improvement), includes the core components of PMTO as well as sessions designed to address immigrant Latino stressors, and is currently being evaluated with immigrant Latino families (Baumann et al. 2011; Domenech Rodríguez et al. 2011). Still, this program does not address new methods of implementation that match the needs of community providers, in order to maximize the degree to which such providers can continue to deliver EST services in the absence of researcher support. To date, culturally-adapted parent training ESTs have largely been tested in small-group or individual treatment modalities within clinical or other researcher-supported settings. As mentioned previously, during FAST implementation, families had a hard time traveling to intervention sites, particularly at night in high violence communities. LHA also had difficulty providing the program in multiple community settings due to the staffing and facilities costs associated with this method of implementation. For example, FAST was a family-based program that included family meals during group sessions, and many of the Latino participants wanted to bring extended relatives or required childcare during sessions. Implementation of this program thus required that LHA purchase additional manuals and food for families, rent larger rooms for sessions, and provide staff for childcare, making the costs of staffing and facilities much less feasible for LHA to sustain beyond the initial research trial.

Indeed, the specific skills required for recent immigrant Latino parents in conjunction with feasible methods of implementation and sustainability may require significant reformulations of ESTs, essentially resulting in theory-driven but modified interventions that are tailored to this particular population and community setting (Lau 2006). This was the strategy that guided the development of the Madres a Madres program. Informed by the ongoing research of the LHA-ACE community-university partnership, the Madres a Madres program was designed to build on critical components of parent training ESTs while also

incorporating identified parenting concerns of the target community and feasibility of the community agency's implementation practices. This collaborative effort resulted in a program that was focused on promoting evidence-based parenting skills and was delivered in a brief, home visitation intervention format that could be easily implemented in the target community by female lay health workers of Latina descent, or *promotoras*.

In designing the program, we looked to the extant literature to select specific parenting skills that were consistently associated with greater program effectiveness. Based on a recent meta-analysis of 77 parent training outcome studies by Kaminski et al. (2008), these components include training in positive communication strategies, time out, and consistent discipline strategies, as well as the practicing of these skills with caregivers and children in-session. These components converge with common elements of ESTs like PMTO and PCIT, both of which focus on positive parent-child interactions and behavioral management strategies (Forgatch and Patterson 2010; McNeil and Hembree-Kigin 2010). In response to the concerns of families in the target community, Madres a Madres also included information on normative child development competencies to guide developmental expectations, and on skills relevant to parenting under contextual conditions that are specific to immigrant parents (e.g., how to maintain authority when children speak English and parents only speak Spanish). Finally, to maximize utilization of community resources, the program also focused on connecting families with local resources (e.g., welfare, housing, and school systems) and opportunities, and teaching mothers to be effective advocates for their children.

With regard to intervention format and implementation, Madres a Madres was designed to be preventive in nature, and as such is brief (four sessions), drawing on research of other preventive interventions for low-income families like the Family Check-Up program (Dishion et al. 2008). To reduce the stigmatization that has commonly been found in relation to mental health care for Latinos (e.g., Parra Cardona et al. 2008) and to increase the limited healthcare access and utilization faced by immigrant populations, the program was implemented in families' homes by promotoras. Home visitation services have long been recognized as a method to access low-income and marginalized populations and to prevent child maltreatment or other health concerns in the United States (Sweet and Appelbaum 2004). This strategy is particularly relevant for families who are unable to access regular and safe transportation to clinic-based services.

Promotor-led interventions are a promising and cost-effective strategy for delivering treatment to marginalized communities and disseminating evidence-based practices (Pérez and Martínez 2008; Rotheram-Borus et al. 2012).

Recent community-based studies have successfully implemented promotor-led interventions with Latina women in particular. For example, Hernandez and Organista (2013) reported the positive effects of a depression and health literacy program for immigrant Latina women that was implemented by promotoras. Kieffer et al. (2013) similarly used trained community health workers to implement a culturally and linguistically adapted depression prevention program among pregnant Latina mothers in a randomized trial that showed significant reductions in intervention participants' depressive symptoms. These studies highlight the use of promotor-led interventions as a method to increase engagement in underserved target communities, to provide culturally sensitive services, and to facilitate feasible intervention implementation strategies in community settings. In the context of the Madres a Madres program, the use of lay health workers is consistent with the pre-existing service delivery strategies used by LHA, making the intervention both more feasible and more sustainable for LHA in the target community.

### The Present Study

In the present study, we piloted the Madres a Madres program in a sample of immigrant Latina mothers and their children. Mothers were the primary targets for intervention given data on normative parenting roles within the predominately Mexican families that LHA serves. As this was a pilot feasibility study, we only report on mothers' outcome data, which will be used to inform subsequent multi-source and multi-method efficacy trials. In this study, we hypothesized that exposure to the Madres intervention would be associated with improvements in mothers' parenting skills. Given the preventive nature of the study, we additionally predicted that intervention participation would be associated with improvements in broad family functioning, and with fewer increases in child internalizing and externalizing behaviors relative to controls.

## Method

### Site and Design

The study was conducted in Santa Ana, CA, a large, urban city of approximately 55,000 residents, 96 % of whom identify as Latino. All data collection occurred between 2006 and 2009. The community partner, LHA, was primarily responsible for study recruitment, participant assessment, and the intervention implementation. Participants were randomized at the individual level to either the intervention or the wait-list control condition. In order to provide services to as many families as possible while still

maintaining the integrity of the randomized controlled design, assignments were weighted: For every 10 families, a computerized randomization model assigned 6 families to the intervention condition and 4 families to the wait-list control condition.

### Participants

A total of 194 mothers each with one focal child (87 male, 107 female) consented to participate in either the intervention (113 mother–child dyads) or wait-list control (81 mother–child dyads) conditions over the three-year study period. Mothers' average pretest age was 34.20 years ( $SD = 5.98$ , range = 22–50 years) and the average age of child participants was 9.47 years ( $SD = 1.53$ , range = 7–12 years). All mothers self-identified as immigrants and the majority reported Mexico as their country of origin (97.9 %). Most child participants were born within the United States (73.2 %) and were of Mexican heritage (97.9 %). At pretest, mothers had lived in the United States for an average of 12.02 years ( $SD = 5.57$ ). Families lived with an average of 7 people ( $SD = 2.80$ ). Most mothers were married (56.6 %). The sample was socioeconomically disadvantaged, with 63 % of mothers reporting a total household income of less than \$15,000 per year, and all mothers reporting a total household income of less than \$50,000 per year.

Families were recruited to participate in the study using door-to-door and word-of-mouth methods, which are consistent with recruitment strategies that LHA has used in prior intervention evaluations (Knox et al. 2011). LHA promotoras knocked on the doors of apartments and homes located in the organization's catchment area, publicized the program to clients at the LHA site, and posted fliers advertising the study at LHA and in the community. Study inclusion criteria were that parents had to be of female gender with a child between the ages of 7 and 12, and could not be receiving concurrent mental health treatment. LHA had a longstanding and positive relationship with the community recruited for this study, which likely produced a high hit rate for consenting participants of those approached for participation. Of the 240 parent participants approached for participation, 46 were ineligible, declined to participate, or failed to complete the necessary informed consent and pretest. Due to the lack of informed consent for this group, detailed information about nonparticipation is unavailable. However, according to promotoras' reports, reasons for declining were typically due to a lack of interest, lack of time for study participation over the required period, or not meeting inclusion criteria.

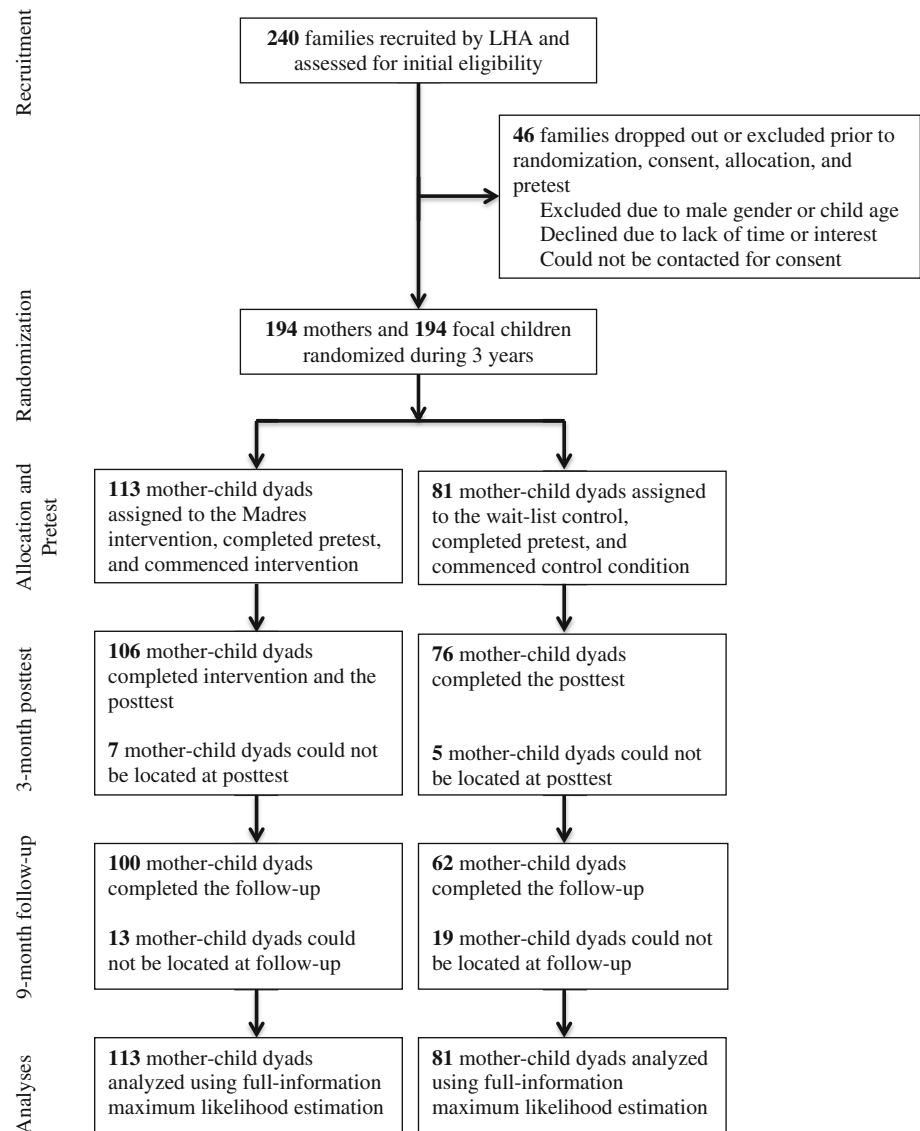
The remaining 194 mother–child dyads provided parental consent and child assent for pretest, in compliance with the overseeing Institutional Review Board. A total of

182 mother–child dyads completed the 3-month posttest and 162 mother–child dyads completed the 9-month follow-up. Due to the transient nature of the sample, promotoras were unable to reach some participants at these study phases because participants had moved or were otherwise unable to be located (e.g., they had disconnected phones). Figure 1 summarizes the recruitment and retention of participants throughout the study.

### Intervention

#### *Madres a Madres Condition*

The Madres a Madres program is a four-session intervention delivered individually to mothers in the home setting by promotoras. Each session is 2 hours, and consists of instruction in four core content areas: (1) normative child development and related social competencies, (2) positive parent–child interaction techniques, (3) positive behavioral management strategies, and (4) service navigation to support access to community resources. In the area of normative child development, mothers learn basic concepts related to child cognitive, physical, and emotional milestones, as a method to promote mothers' developmentally appropriate expectations for child behavior. Adapted from PCIT (McNeil and Hembree-Kigin 2010), promotoras teach mothers to increase positive communication with the focal child through the use specific skills during a designated interaction period. Called *15 Minutos Mágicos* (Magic Minutes), mothers spend time engaged in specialized activities and communication with their child. Skills include following the child's lead, reflective listening, and providing the child with specific praise. These skills and the parent–child activities were modified according to the focal child's developmental level. For instance, with a younger child (ages 7–8) the mother–child dyad might engage in a game or color together, whereas with an older child (ages 11–12) the dyad might choose to make a meal together, take a walk, or just talk. During each session, promotoras teach or review these skills, coach mothers in session, and then assign the mothers homework to engage in the 15 Magic Minutes 3–4 times per week. Positive behavior management strategies are derived from PMTO (Forgatch and Patterson 2010), and involve teaching the mother to ignore minor misbehavior, to discuss rules with the child, and to implement a system of consequences (*1–2–3 Consecuencias* [Consequences]) in cases of un-ignorable misbehavior. Consequences include time-out or a contingency management system, depending on the mother–child dyad. Finally, promotoras provide mothers with relevant information about community resources (e.g., housing or food programs; after-school care).

**Fig. 1** Diagram of participant flow through each phase of the study

Visual materials, video segments, interactive role-plays, and worksheets are used to teach mothers the above intervention content. Materials were designed specifically for use with Spanish-speaking mothers with low levels of literacy and integrate familiar, community-relevant content. Program sessions are organized around *El Camino de Esperanza* (The Path of Hope), a visual discussion tool that orients mothers to the four intervention components. Mothers also develop a Personal Parenting Record (PPR), which is a strategic plan for child behavior management goals. Promotoras and mothers develop the PPR during the first session, and use it throughout the intervention to monitor goals and problem-solve any issues that arise.

Madres a Madres uses promotoras as “coaches” rather than “experts.” There is also a focus on *familismo*, or the importance of family involvement, as well as

*personalismo*, in that promotoras are encouraged to spend time building rapport with mothers and supportively connecting them with ancillary services and other mothers in the community. Mothers in the program are invited to take part in monthly meetings called *Cafecitas* or *Quermes*, that are designed to bring mothers from the same neighborhood together to provide opportunities for social connection, support, and mobilization around the needs of families in the community.

Intervention participants in the current study were involved in Madres a Madres on a bi-weekly basis, so that the four sessions occurred over a two-month period. In the case of scheduling difficulties, mothers were able to schedule with up to three weeks between sessions. All sessions were completed within a period of three months following the pretest assessment.



### *Wait-List Control Condition*

Participants on the waiting list did not have any form of planned contact with the project team during each phase of the study, except for when arranging the date and time of the pretest, posttest, and follow-up assessments. Following completion of the 9-month follow-up period, control participants were offered the *Madres a Madres* program.

### *Treatment Delivery and Fidelity*

Promotoras were females of Latina heritage working at LHA as community health workers at the time of study recruitment. Each promotora had a caseload of six families at one time. LHA-ACE provided intervention training, which occurred over a five-day period and focused on teaching core intervention content as well as role-play techniques, assessment of family needs, and rapport-building strategies. To optimize treatment fidelity, intervention materials included flipbooks with scripts and bulleted key points to use as a guide throughout the sessions. Promotoras received weekly supervision by licensed LHA psychologists or social workers of similar ethnic and cultural background. Non-scheduled live supervision visits were conducted at random by supervisors to observe actual practices during intervention sessions, with each promotora receiving two visits per intervention cycle.

### *Assessment*

Participants were assessed with the following measures at pretest, posttest (3 months after pretest), and follow-up (9 months after pretest) periods. LHA staff blinded to the condition assignment conducted all the assessments in families' homes. Participants were paid \$50.00 for measure completion at each of the three assessment periods. All survey items had been previously used in LHA evaluations with predominately Spanish-speaking Latino immigrants (e.g., Knox et al. 2011; Leidy et al. 2010b).

### *Parenting Skills*

Mothers reported on their positive parenting skills using an adapted 7-item scale that included skills like limit setting, positive reinforcement, and effective communication (Gorman-Smith et al. 1996). A sample item is “were you able to communicate calmly and clearly with your child when there were disagreements or problems?” Mothers rated the extent to which they used each skill in the past month on a 3-point Likert scale, with higher scores indicating greater use of the parenting skills. Leidy et al. (2010b) have found this measure to be reliable ( $\alpha = .79$ ) and predictive of child social functioning outcomes among

immigrant Latino parents. Baseline coefficient alpha with this sample was .78.

### *Family Functioning*

Mothers reported on family cohesion (9 items), support (6 items), and organization (6 items) using subscales from a family functioning measure that was designed for and validated with low-income minority families (Tolan et al. 1997). Items were rated on a 4-point Likert scale, with higher scores for each of the subscales indicating better family functioning. Tolan et al. (1997) have demonstrated acceptable reliability ( $\alpha = .54-.72$ ) and validity for these subscales on a diverse sample that included Latino parents. Baseline coefficient alpha for this sample was .71 for cohesion, .61 for support, and .58 for organization. Reliability is somewhat low for the organization subscale, but is consistent with the findings of Tolan et al. (1997).

### *Child Behavior*

Mothers reported on externalizing (10 items) and internalizing (8 items) behavior using subscales from the Social Competence and Behavior Evaluation (SCBE-30; LaFreniere and Dumas 1996), which Knox et al. (2011) have found to be reliable for Latino children in the target age group. Mothers rated the frequency of externalizing (e.g., “My child hits, bites, or kicks other children”) and internalizing behavior (e.g., “my child is sad, unhappy, or depressed”) on a 6-point scale, with higher scores indicating more frequent behavior problems. Baseline coefficient alpha was .82 for externalizing and .81 for internalizing.

### *Data Analytic Approach*

We constructed two-level growth models using *Hierarchical Linear Modeling 7* software (HLM 7; Raudenbush et al. 2011) to test intervention effects. Growth modeling allows for the examination of differences in within-person growth trajectories over the pretest, posttest, and follow-up periods, while also providing a test of the average intervention effect. Specifically, these analyses determine whether changes in the outcome measures over the study period are in the desired direction for the intervention participants, and whether these changes are significantly different from those in the control group. Group differences are indicated by a significant time-by-group cross-level interaction coefficient. For these growth models, the pretest, posttest, and follow-up assessment periods were entered as the level 1 (within-person) variable  $TIME_{it}$ , coded as 0 (pretest), .33 (posttest), and 1 (follow-up). so

that level 2 slope coefficients represent the total average change, or growth, in the outcome over the entire 9-month study period. To test potential differences in pretest outcome levels and in the intervention effect over time, intervention condition ( $GROUP_i$ ) was entered as a binary level 2 predictor of within-person intercepts and slopes, with the intervention condition coded as 1. This resulting equation includes the coefficient for the group difference over time, or the time-by-group cross-level interaction term:

$$OUTCOME_{ii} = \beta_{00} + \beta_{01}(GROUP_i) + \beta_{10}(TIME_{ii}) + \beta_{11}(GROUP_i)(TIME_{ii}) + r_{0i} + r_{1i}(TIME_{ii}) + e_{ii}.$$

When outcomes were highly skewed and could not be successfully transformed, we used nonlinear growth modeling on a Poisson sampling distribution with overdispersion. Nonlinear modeling is also referred to as Hierarchical Generalized Linear Modeling by Raudenbush and Bryk (2002) and includes sampling distributions that are robust to violations of normality, such as the Poisson distribution. The Poisson distribution is typically used to analyze count data, but is appropriate for analyzing severely skewed outcomes that violate standard linear modeling assumptions (i.e., a normal distribution of residuals; Cox et al. 2009; Raudenbush et al. 2011). Overdispersion is appropriate to specify when the variance of an outcome exceeds its mean (Cox et al. 2009; Raudenbush et al. 2011). Without a specification of overdispersion, Type I error rates are inflated due to inappropriately small standard errors (Cox et al. 2009). As such, we used a Poisson distribution with overdispersion in these cases. The equation for a Poisson model with overdispersion does not include an individual level error term, but otherwise is specified according to the linear model shown above, with  $TIME_{ii}$  at level 1 and  $GROUP_i$  at level 2.

In a Poisson model with overdispersion, the predicted outcome variable is transformed in HLM using a natural logarithmic transformation, which linearizes the association between the outcome variable and the predictors. This model provides unstandardized coefficients in a natural log transformed metric. To interpret these coefficients, one must exponentiate the value of the coefficient. The resulting value, called an event rate ratio, is interpreted as the predicted percentage of increase or decrease in the outcome variable, depending on the value of the exponentiated coefficient, given a one-unit shift in the predictor.

Effect sizes (Cohen's  $d$ ) were calculated by dividing the slope coefficient for the group difference in change over time (the time-by-group interaction term) by the pooled pretest standard deviation, consistent with recommendations by Feingold (2009). For nonlinear models, the

coefficient from the corresponding linear model was used for these calculations.<sup>1</sup>

## Results

### Randomization Check

Table 1 shows means and standard deviations for all outcome measures at pretest, posttest, and follow-up periods. Chi square analyses for binary variables and independent  $t$  tests for continuous variables were used to identify any statistically significant pretest differences in demographics or study outcomes between the intervention and the wait-list control conditions. Analyses revealed two small pretest group differences. The control group showed slightly higher pretest parenting skills,  $t(192) = 1.90$ ,  $p = .06$ , and family support,  $t(192) = 1.67$ ,  $p = .10$ . Subsequent HLM analyses controlled for pretest differences by including level 2 intercepts as a covariate when estimating the treatment effect (level 2 slopes) for these outcomes. No other significant pretest differences in study outcomes or demographics by group were found.

### Missing Data

Logistic regressions predicting a general missingness (non-response to items and/or study attrition) dummy code at either the posttest or the follow-up period showed that demographic characteristics and pretest study outcomes were not significantly associated with missingness. When study attrition was examined separately, individuals in the control condition were significantly more likely to attrit at the follow-up time point only, odds ratio = 0.38,  $z = -2.35$ ,  $p = .019$ , 95 % CI [0.17, 0.85]. However, no other demographic or pretest variables were associated with study attrition at each study time point. Based on these findings, we assumed that data were missing at random (MAR), as the probability of general missingness and study attrition were found to be independent of the pretest outcomes (Raudenbush and Bryk 2002). Under the assumption of MAR, missing data may depend on other observed variables, such as intervention condition (Gallop and Tasca 2009). Missing data were subsequently handled with full-information maximum likelihood (FIML) estimation in HLM 7, which treats data as MAR, resulting in unbiased parameter estimates and appropriate standard errors (Arbuckle 1996). FIML uses all available information, allowing for analysis of the full sample of 194 mother-child dyads.

<sup>1</sup> Models were tested using both linear and nonlinear approaches and showed the same pattern of results.

**Table 1** Means and standard deviations for outcomes at pretest, posttest, and follow-up, and intraclass correlations from multilevel models

Outcome	Pretest <i>M (SD)</i>		3-month posttest <i>M (SD)</i>		9-month follow-up <i>M (SD)</i>		ICCs from multilevel models	
	IC <i>n</i> = 113	WLC <i>n</i> = 81	IC <i>n</i> = 106	WLC <i>n</i> = 76	IC <i>n</i> = 100	WLC <i>n</i> = 62	Within person	Between person
Parenting skills	10.97 <sub>a</sub> (2.65)	11.81 <sub>a</sub> (2.48)	11.81 (2.35)	12.03 (2.28)	11.51 (2.38)	10.97 (2.90)	.68	.32
Family cohesion	15.05 (2.73)	15.70 (2.38)	15.56 (2.76)	15.71 (2.62)	15.32 (2.79)	15.10 (2.68)	.55	.45
Family support	10.96 <sub>a</sub> (3.49)	11.79 <sub>a</sub> (3.42)	12.35 (3.07)	12.73 (2.45)	11.88 (3.27)	11.18 (3.18)	.66	.34
Family organization	13.83 (3.39)	14.07 (3.60)	14.94 (2.79)	15.53 (2.66)	14.91 (3.01)	14.14 (3.39)	.63	.37
Child externalizing behavior	14.23 (8.67)	13.19 (7.37)	12.69 (9.19)	10.81 (7.54)	12.70 (8.71)	11.00 (5.84)	.26	.74
Child internalizing behavior	8.91 (6.43)	7.75 (5.28)	6.69 (6.81)	5.89 (5.40)	5.80 (5.80)	7.27 (6.63)	.35	.65

Subscript *a* indicates pretest difference; *n* refers to highest sample size at that study period. *IC* intervention condition, *WLC* wait-list control condition, *ICCs* intraclass correlations from multilevel models; within person =  $\sigma^2/(\sigma^2 + \tau_{00})$ ; between person =  $\tau_{00}/(\sigma^2 + \tau_{00})$  (Raudenbush and Bryk 2002); for nonlinear models, ICCs were calculated from the corresponding linear model

### Intervention Attendance and Attrition

Of the 113 mother–child dyads that were allocated to the intervention, 106 dyads attended all 4 of the intervention sessions, a high attendance rate which LHA attributed to the home visit intervention format. Seven intervention mother–child dyads could not be located at posttest, and an additional six dyads could not be located at follow-up. For the seven dyads that did not complete the intervention, reasons for dropout included moving elsewhere or losing contact with the project team and promotoras. As stated above, logistic regressions predicting attrition showed that those in the wait-list control condition were more likely to attrit at the follow-up only, but that no demographic or pretest variables were associated with attrition. Percent calculations show similar rates of posttest attrition for the intervention (6.19 %; 7/113) and control (6.17 %; 5/81) groups. At follow-up, the intervention group had an attrition rate of 11.50 % (13/113), which was significantly less than the 23.46 % (19/81) rate for the control group, ( $\chi^2(1, N = 194) = 4.90, p = .02$ ). The intervention attrition rate is lower than those reported by other parent training evaluations with Latino families, and the control attrition rate is comparable (e.g., McCabe and Yeh 2009; Reid et al. 2001).

### Intervention Outcomes

Table 1 shows intraclass correlation coefficients (ICCs) for all study outcomes, which partition each outcome into

within-person (level 1) and between-person (level 2) variance. Table 2 shows the results of the multilevel linear and nonlinear growth models for each outcome.

### Parenting Skills

Because the parenting skills variable was negatively skewed, it was reflected prior to analysis, and then analyzed using an overdispersed nonlinear Poisson growth model. Due to the reflection, this model is testing for *decreases* for the intervention group in the reflected outcome as a sign of improved parenting, as opposed to testing for *increases* in parenting skills. Controlling for pretest group differences, results showed a statistically significant group difference in skills over time in favor of the intervention condition,  $\exp(b) = 0.52, t = -2.28, p = .02$ , and an increase (a decrease in the original metric) in the control condition's average parenting skills over the study period,  $\exp(b) = 1.51, t = 1.97, p = .05$ . An interpretation of the exponentiated time-by-group interaction term shows that there was a 48 % difference between the intervention and control conditions. Stated otherwise, the intervention group showed significant decreases in the reflected outcome, or increases in the original parenting skills variable, whereas the control group showed significant decreases in the original parenting skills outcome. The effect size for this difference, calculated from the corresponding linear model for the reflected outcome ( $b = -1.53, t = -2.23, p = .03$ ), was moderate (0.60).



**Table 2** Multilevel linear and nonlinear models with intervention effect sizes for study outcomes (N = 196)

	Parenting skills <i>exp(b)</i> [95 % CI]	Family cohesion <i>b</i> [95 % CI]	Family support <i>b</i> [95 % CI]
WLC pretest	1.75 [1.35, 2.26]***	15.78 [15.25, 16.31]***	12.24 [11.61, 12.86]***
IC difference	1.46 [1.07, 1.98]*	−0.52 [−1.02, 0.17]	−0.79 [−1.61, 0.03] <sup>†</sup>
WLC slope	1.51 [1.01, 2.29]*	−0.69 [−1.34, −0.04]*	−0.02 [−0.88, 0.84]
IC difference	0.52 [0.39, 0.93]*	0.81 [−0.03, 1.65] <sup>†</sup>	1.48 [0.32, 2.64]*
Pretest control	0.83 [0.51, 1.36]	–	−0.07 [−0.58, 0.44]
<i>Random effects</i>			
Intercept variance	0.40***	3.14***	3.81***
Slope variance	0.24*	0.15	0.27
<i>Effect size</i>	0.60	0.31	0.43
	Family organization <i>b</i> [95 % CI]	Child externalizing <i>b</i> [95 % CI]	Child internalizing <i>exp(b)</i> [95 % CI]
WLC pretest	14.63 [13.98, 15.28]***	12.44 [10.68, 14.20]***	6.39 [5.44, 7.50]***
IC difference	−0.44 [−1.28, 0.40]	1.27 [−1.04, 3.58]	1.13 [0.92, 1.40]
WLC slope	−0.30 [−1.14, 0.54]	−1.93 [−3.40, −0.46]**	0.87 [0.72, 1.05]
IC difference	1.24 [0.14, 2.34]*	0.76 [−1.10, 2.62]	0.65 [0.61, 0.82]***
<i>Random effects</i>			
Intercept variance	4.77***	54.94***	0.34***
Slope variance	1.40	7.76***	0.06
<i>Effect size</i>	0.36	0.09	0.46

IC intervention condition, WLC wait-list control condition, *exp(b)* exponentiated coefficient for nonlinear models. For nonlinear models, effect sizes are presented in absolute values and were calculated according to the corresponding linear models

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

### Family Functioning

Family functioning analyses showed significant group differences in family support (controlling for slight pretest differences),  $b = 1.48$ ,  $t = 2.51$ ,  $p = .01$ , and in family organization,  $b = 1.24$ ,  $t = 2.24$ ,  $p = .03$ , both of which favored the intervention group. There were also marginal increases for the intervention group in family cohesion,  $b = 0.81$ ,  $t = 1.90$ ,  $p = .06$ . Effect sizes for these outcomes were small, with 0.43 for family support, 0.36 for family organization, and 0.31 for family cohesion.

### Child Behavior

Mothers in both conditions reported decreased child externalizing behavior problems over the study period, but there were no significant group differences for this outcome, and the effect size of the group difference was not meaningful (0.09). A nonlinear growth model using an overdispersed Poisson distribution revealed a statistically significant difference between the intervention and control conditions on child internalizing behavior,  $exp(b) = 0.65$ ,  $t = -3.55$ ,  $p < .001$ , such that the intervention condition showed 35 % more of a decrease in the outcome than the

control condition. The effect size for this difference, calculated using the linear model coefficient ( $b = -2.75$ ,  $t = -3.40$ ,  $p < .001$ ), was small (0.46).

### Post-Hoc Moderation Analyses

Post-hoc analyses were conducted to examine the potential moderating effects of child age, child gender, child nativity status (immigrant versus US-born), and a proxy for parent acculturative status (reported pretest years in the US, with greater years reflecting higher acculturation) on intervention outcomes. We entered these four variables (centered child age and parent acculturative status; dummy coded female gender = 1 and US-born = 1) as well as four variable-by-group interaction terms at the level 2 slope equations for all outcomes, to test for main effects and for whether variables exerted a differential effect on change over time by group condition. A small main effect emerged for child internalizing, such that mothers with more years spent in the US reported 4 % less change in this outcome in both groups,  $exp(b) = 1.04$ ,  $t = 2.24$ ,  $p = .03$ . No other significant main effects were found across all outcomes. All variable-by-group interaction terms were non-significant, indicating that program outcomes did not vary by

child age, gender, nativity status, or the proxy for parent level of acculturation.<sup>2</sup>

## Discussion

We piloted a brief, culturally sensitive preventive parent training program among a sample of immigrant Latina mothers and their elementary school-aged children. Results of this pilot study indicate that the Madres a Madres program is promising in its ability to retain program participants, as the intervention showed an attrition rate that was quite low compared to other behavioral parent training programs (e.g., McCabe and Yeh 2009; Reid et al. 2001). Despite the brief nature and limited dosage of the Madres a Madres program, mothers reported improvements in parenting skills, aspects of family functioning, and child internalizing concerns. Mothers' reported improvement in positive parenting skills adds to a growing body of literature suggesting that behavioral parent training techniques are applicable to immigrant Latino parents (Domenech Rodríguez et al. 2011; Martinez and Eddy 2005), and demonstrates that relatively complex behavioral strategies can be delivered with success by lay community health workers. Control mothers' parenting skills decreased over the course of the 9-month study period. This finding could reflect the impact of ongoing contextual stressors over the course of the study, such as immigration raids or housing and welfare concerns, on parenting skills. Without intervention services, it may be difficult for some parents to maintain effective parenting strategies when confronted with contextual stressors, however, this assumption should be tested empirically with this particular population in future studies.

Although the program did not specifically provide mothers with skills to improve family functioning, results showed that mothers reported significant improvements in family support and organization and marginal improvements in family cohesion. Few parent training programs have assessed effects on family functioning. We chose to do so because of the program's integration of the Latino cultural value of *familismo* and based on the idea that both parenting skills and family functioning have bearing on the prevention of child behavior problems, particularly for Latino families (Leidy et al. 2010a, b). It is possible that mothers' *perceptions* of their parenting and family functioning improved as a result of intervention participation, as we do not have observational measures of parent-child and family interactions. However, we intend to examine these outcomes more comprehensively in future studies.

<sup>2</sup> These analyses are not included in table format due to space limitations.

The Madres a Madres program was designed as a preventive intervention, and is not meant to be an alternative treatment for clinically significant child internalizing and externalizing conditions. For this reason, we expected to see less growth in child behavior problems in this lower-risk community sample, as opposed to reductions in these outcomes. For child internalizing concerns, we found not only less growth in this outcome, but also that intervention mothers reported significant decreases in child internalizing behavior, which did not vary by child age, gender, or nativity status. Studies of parent training interventions with similar components, such as the IY program, have also yielded decreased child internalizing problems (Webster-Stratton and Herman 2008). It may be that particularly for children who live in high poverty contexts, increased parenting skills and enhanced parent-child interactions serve to reduce children's anxiety and sadness, although this warrants further empirical examination.

In contrast to many behaviorally oriented parent training programs, we did not find an intervention effect for child externalizing problems, although both groups showed small decreases in this outcome. One reason for this finding may be our use of a less sensitive measure of aggression that asked about more normative behaviors for this age group, such as being irritable and easily frustrated (LaFreniere and Dumas 1996). Although this measure included several items related to oppositionality, defiance, and aggression, a more sensitive measure of aggressive and rule-breaking behavior would have been useful. Additionally, few children in the sample showed extreme levels of aggressive behavior. It is possible that effects on aggressive behavior are limited by the use of a community rather than a clinic-referred sample, as well as by the brief nature of the Madres a Madres program. Significant externalizing problems are unlikely to be resolved without intensive intervention; the Madres a Madres program is inappropriate for such concerns. As we only assessed mothers 6 months post-intervention, it is also possible that sleeper effects on the prevention of aggressive behavior could emerge as intervention children age. In previous qualitative work with this population, we found that parents were more concerned about aggressive and rule-breaking behavior during adolescence (Knox et al. 2011). Preventive effects of this intervention may thus be more salient when the intervention children, who were an average age of 9 during this study, reach adolescence.

## Limitations and Directions for Future Research

Study findings should be considered in light of several important limitations, all of which motivate future research on the Madres a Madres program. First, the randomized-controlled design is a rigorous method for testing efficacy,

but the randomization technique for our study did not produce equivalent groups for two pretest outcomes. Although we controlled for slight pretest differences in treatment effect analyses, efficacious outcomes from this study should be interpreted with some caution. Second, there are several measurement-related methodological concerns. As this was a pilot study, we examined only mother-reported outcomes. Findings from this study may be biased due to the self-report nature of the study measures and source invariance. Multi-method and multi-source strategies will be used in future research on this program, particularly to assess parenting skills. Because *Madres a Madres* includes the teaching and practicing of parent–child interactions, the use of observational coding systems as well as skill ratings by promotoras would have provided a more robust test of change in parenting skills and family functioning over time. Future studies will also assess broader parenting skill domains that are reflective of the intervention content (e.g., multi-source and method measures for behavior management strategies, parent–child interactions, and parental knowledge of child development). We also plan to assess the impact of the *Madres a Madres* program on community service utilization, given the program’s focus on connecting mothers with local resources.

Third, results from this study could also have been strengthened through other outcome measures of child behavior and parent characteristics. For example, clinical scales with normed cutoffs for internalizing and externalizing concerns would have been useful in determining the clinical significance of intervention findings and comparing child behavior problems in this study with a normative sample. A measure of child social competencies would also be important to include in future work, given that increased parenting skills have been associated with improved child prosocial behaviors (Leidy et al. 2010b). As research has shown that parental stress and mental health concerns can disrupt effective parenting practices (Forgatch and Patterson 2010), additional data on parent mental health status should be included as a potential moderator of program effects. Parental stress levels as well as social connectedness following intervention are also outcomes that are relevant for future evaluations of this program. Finally, although we found no differential program effects according to mother-reported years in the US, a proxy for acculturation, these findings must be replicated with more comprehensive acculturation measures, especially due to the small main effect for child internalizing behavior.

Fourth, study findings are limited by the use of a highly specific target population. This program was designed for and tested among a predominately Mexican sample in a particular region of Southern California, in response to research on the specific parenting and contextual concerns

of this community (Guerra and Knox 2008; Knox et al. 2011). The culture of immigrant Latino families is not homogenous and various contextual circumstances (e.g., level of poverty, parent–child acculturative gaps; fear of immigration raids/deportation) may differ widely across Latino individuals. As such, this study is limited in its generalizability to Latino immigrants from other countries, and to those living in different social contexts. Study findings are additionally limited to mothers, as fathers were not eligible for participation. Despite the community agency’s data on normative parenting roles in this population, future program evaluations should include and compare outcomes for fathers, consistent with other Latino-focused family-based interventions for child behavior problems (Martinez and Eddy 2005; McCabe and Yeh 2009).

Finally, this preventive intervention was evaluated in a community, as opposed to a clinical, sample, which may impact the generalizability of the treatment to clinic-based samples, and also limits comparisons to other behavioral parent training ESTs that were designed for clinically significant child internalizing and externalizing concerns.

Future studies of this intervention should test the underlying theory of change in the *Madres a Madres* parenting program—namely, that an increase in parenting skills and knowledge during the intervention will mediate diminished growth in child behavior problems. Although there were improvements in parenting skills and a significant effect on one of the child behavior outcomes, the relationship between parenting behaviors, knowledge, and child behavioral outcomes remains to be tested in the context of this intervention program.

## Conclusions

Despite these limitations, the outcomes of this study demonstrated preliminarily that *Madres a Madres* is a promising method for intervening with immigrant Latina mothers and their children. Based on attrition data, providing intervention in mothers’ homes appears to be useful in retaining mothers during the intervention period. Additionally, effect sizes for the parenting skills, family functioning, and child internalizing outcomes that favored the intervention condition were in the small to medium range, which is comparable to effect sizes for other brief and preventive family interventions, like the Family Check-Up (Dishion et al. 2008). These effects are also within the range of meta-analytic effect sizes for similar outcomes of other parent training programs (i.e., 0.39 for parenting skills, 0.22 for parent–child interactions, and 0.40 for child internalizing, among other small to medium effects reported by Kaminski et al. 2008).

Finally, this study supports the use of promotoras for delivering brief, culturally relevant parent training to immigrant Latina mothers, and adds to the growing body of literature on promotor-led interventions (Hernandez and Organista 2013; Kieffer et al. 2013). The use of promotoras is a cost-effective option for delivering preventive interventions to marginalized and culturally diverse communities (Rotheram-Borus et al. 2012). To our knowledge, this approach has not been previously tested in the context of parent training program evaluations. Importantly, this practice is consistent with the pre-existing practices of LHA, the community organization providing services to the target population, which increases the likelihood that the intervention will be sustained without further researcher support. We are unaware of the extent to which other culturally adapted parent training programs cited in this paper have been replicated in community sites and without the use of professional (i.e., master or doctoral level) and/or researcher-supported interventionists. In the service of reducing the longstanding gap between research and practice in the provision of ESTs, partnering with community agencies to deliver evidence-based interventions is a critical direction for future research. Although additional and extended research on this program is necessary to support the efficacy of this intervention, to discern the effects of the program on long-term changes in parent and child behavior, and to identify the program's primary mechanisms of change, *Madres a Madres* is an innovative approach to disseminating evidence-based intervention practices in a culturally sensitive fashion to immigrant Latino populations.

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