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THE DOMINO EFFECT:

**Maternal Self-efficacy, Depressive Symptoms, Maternal-Child Interactions in Mothers
from Mexico**

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ABSTRACT

Background: The Latino population is the fastest growing population group in the U.S. and Latina women have the highest fertility rates of any group in the U.S. Yet, few studies of motherhood and parenting have included Latinas.

Objectives: As part of a larger study testing a nursing intervention for Spanish-speaking Early Head Start Mexican mothers with significant depressive symptoms, this project was designed to explore the characteristics of symptomatic and asymptomatic mothers and the factors that have an impact on infant and toddler socio-emotional health.

Methods: Questionnaires were completed by a cross-section of foreign-born Mexican women entering EHS programs. Data were analyzed using descriptive statistics and a series of multiple regressions.

Results: We identified a domino effect where family financial stress develops into family conflict ($p < .1$); family conflict together with a loss of social support reduces maternal self-efficacy ($p < .01$); the erosion of maternal self-efficacy increases the risk of depressive symptoms ($p < .01$); and the presence of significant depressive symptoms impairs the mother's ability to provide a supportive developmental environment for her infant/toddler ($p < .01$).

Discussion: Psychiatric nurses working through Early Head Start (EHS) programs are in a critical position to intervene with mothers at risk for depression. Working through EHS, nurses can serve as "acculturation mentors" for immigrant Latina mothers and provide them with the skills need to reduce the stresses of acculturation, manage family conflict, and improve their maternal self-efficacy.

Key Words: depressive symptoms, maternal-child interactions, Latina, Mexican

INTRODUCTION

The Latino population now comprises 14% of the U.S. population and is the fastest growing population group in the country (Files, 2005). Moreover, women in their childbearing years (ages 18-44) comprise 21% of the Latino population in the U.S. (U.S. Census, 2005) and have the highest fertility rates of any group in the country (Downs, 2003). Yet, few studies in nursing have focused specifically on Latina mothers and the factors that promote their well-being and the development of their infants and toddlers (Heilemann, Lee & Kury 2002; Dennis et al. 2003).

Not only has the Latino population been growing rapidly throughout the last decade but it has also been expanding geographically into new receiving communities. Among these new receiving communities, the state of North Carolina ranked first in the growth of the Latino population during the last decade. The Latino population in North Carolina increased 394% between 1990 and 2000 and now numbers over 400,000 (National Council of La Raza 2001; State of North Carolina Office of State Budget 2001; Center for Urban Affairs and Community Services at North Carolina State University 1999).

Lacking an established infrastructure for serving multilingual and multicultural populations, North Carolina and other states with emerging Latino populations face many challenges in providing health services to them. In 2000, Early Head Start (EHS) staff who served emerging Latino communities in North Carolina reported that many of these mothers were struggling with depressive symptoms (Beeber, Canuso & Emory, 2004). Since little was known about these mothers and their families, this study was undertaken in conjunction with Early Head Start programs in North Carolina. As part of a larger study testing a nursing intervention for Spanish-speaking EHS Latina mothers with significant depressive symptoms,

this project was designed to examine key factors associated with depression in immigrant Latina mothers and the effects of depression on parenting infants and toddlers. That is the focus of this paper.

In section 1, we review the literature on maternal depression and infant-toddler development. In section 2, we develop the conceptual model that guided our analysis. Section 3 provides information on the sample, measures, and analytic techniques used in this analysis. Section 4 summarizes our results and section 5 concludes.

BACKGROUND

An infant or toddler's development hinges on the provision of a secure and developmentally challenging environment. Their language acquisition, secure attachment, and emotional self-regulation develop in response to the stimulation of maternal attentiveness, affectionate touch, child-centered conversation, and spontaneous play (Harnish, et al. 1995; Klimes-Dougan, et al. 1999; Lyons-Ruth, Connell, et al. 1990; Zeanah, Boris, et al. 1997; Coyl, Roggman, et al. 2002). These maternal behaviors are jeopardized by depressive symptoms that blunt a mother's affect, constrict her speech, dampen her expression of joy, and interrupt contingent responses to the infant or toddler's cues and behaviors (Breznitz & Sherman, 1989; Goodman, Harnish, Dodge & Valente, 1995; Hart, Field, & Nearing, 1998; Hoffman & Hatch, 2000; Klimes-Dougan, et al., 1999; Lyons-Ruth, Connell & Grunebaum, 1990; Zeanah, Boris & Larrieu, 1997).

These altered maternal behaviors can compromise an infant's socio-emotional health and the attainment of developmental milestones (Field 1995; Field 1998; Lyons-Ruth, et al. 1990; Murray, Kempton, et al. 1993; Zeanah, Boris, et al. 1997; Kaplan, et al. 1999). Infants of

depressed mothers whose symptoms persist longer than 6 months have demonstrated less vocalization and greater negative affect. Developmental lags often persist into the toddler era (Murray, Fiori-Crowley, et al. 1996). Toddlers with depressed mothers have shown poor socialization skills, negative self-concept and intractable tantrums (Cicchetti, et al. 1997; Cohn, et al. 1986; Hart, et al. 1999; Needlman, et al. 1991).

Low-income mothers bear four times the risk for developing severe depressive symptoms compared to middle-income mothers (Lanzi, et al. 1999; Brown & Moran 1997) If, in addition to restricted income, social support is not present and situational stressors are continuous and high, the negative impact of maternal depressive symptoms on infant and toddler mental health is further amplified (Rutter & Quinton 1984; Goodman & Gotlib 1999; Beeber & Miles 2003). All of these risk factors may be present in Latina immigrant mothers with infants and toddlers.

At the same time that immigrant Latina mothers are at high risk for depression due to socio-economic factors, they are also unlikely to receive mental health treatment (United States Department of Health and Human Services 2002). Most do not have public or private health insurance (Fremstad & Cox 2004). Furthermore, most mothers are able to work best with mental health providers who speak Spanish and who are familiar with Latino culture. However, low-cost, bilingual, culturally-sensitive mental health providers are scarce or nonexistent in many areas of the U.S. Finally, Latina mothers may fear that acknowledging a mental health problem and seeking assistance will lead to trouble with authorities (Barcelona de Mendoza 2001; McGuire & Georges 2003). As a result, many Latina mothers struggle with depressive symptoms in isolation, placing their children at even more risk for difficulties that will eventually require costly interventions (Coyle, et al. 2002; Heckman & Masterov 2004).

To facilitate a positive adaptation to the United States and prevent the negative effects of acculturation stress on infants and toddlers, Early Head Start (EHS) programs reach out to newly-arrived, low-income Latina mothers and their US-born infants and toddlers. These federally-funded infant-toddler enrichment programs provide bilingual home visitors who conduct culturally congruent child-development support.

While mothers may initially seek out services from Early Head Start (EHS) to obtain childcare and resources to support the development of their children, the EHS provider is in a critical position to intervene with mothers at risk for depression (Mann 1997). Child enrichment programs such as EHS can also provide a mentoring network and a bridge between a mother's culture of origin and mainstream American culture (U.S. Department of Health and Human Services 2000). This bridge can be used to reduce the social isolation of immigrant mothers; to teach mothers skills in navigating U.S. institutions and culture; and to help mothers learn effective parenting strategies in the U.S. context. By focusing on Latina mothers already enrolled in EHS, this study was able to quickly transform research into practice.

CONCEPTUAL MODEL

As reflected in our conceptual model (Figure 1), we hypothesize that there is a domino effect that ultimately results in poor outcomes for children of immigrant mothers who experience depressive symptoms. Our model of these domino effects draws on the Vulnerable Populations Conceptual Model (Flaskerud & Winslow, 1998), research in immigration and adaptation (Alderete et al. 2000), and research on economic deprivation and maternal depression (Dennis, et al. 2003; Conger and Elder, 1994).

[INSERT FIGURE 1 HERE]

In essence, the first domino is immigration to the U.S. The first domino falls when new immigrant mothers experience financial difficulties in their transition to the United States. The second domino falls when these financial stresses lead to additional family instability or family conflict. These family conflicts reduce the mother's sense of self-efficacy and, in the absence of social support and acculturation, they can send a mother cascading towards depression. In the presence of depressive symptoms, mothers withdraw from parenting and provide a less supportive home environment to their children. At the same time, parenting stress increases and parent-child interactions become dysfunctional. This is the last domino that ultimately compromises the socio-emotional development of the infant/toddler.

In research on migration, new immigrants from Mexico and other Latin American countries consistently report moving to the U.S. to find work and to build a better future for their children (Perreira & Chapman, in press; Massey, 2000). They value hard work and seek to invest in their children (National Council of La Raza 2001). As with the many immigrants that came before them, they have a strong sense of optimism and self-efficacy directed at overcoming adversity and building a better future for their families (United States Department of Health and Human Services 2002).

Despite their aspirations, acculturation to the U.S. offers both opportunities and dangers for them and their children (Acevedo 1999; Kaplan & Marks 1990; Portes & Rumbaut 1996). Studies of acculturation have shown that Latina mothers who adapt optimally maintain interpersonal ties to significant others within their culture of origin and simultaneously develop ties to new "acculturation mentors" (Rhodes, et al. 1994; Munoz, Ying, et al. 1995; Petterson & Albers 2001). It is through these ties that Latina mothers acculturate and socialize their infants and toddlers. Depressive symptoms interfere with this vitally important process (Munet-Vilaro,

et al. 1999; Vega, et al. 1986; Munoz, et al. 1995; NICHD Early Child Care Research Network 1999).

When a Latina immigrant mother encounters challenges that prevent her from creating the strong, intact family and better life that she had idealized, her sense of self-efficacy erodes. This erosion of self-efficacy puts mothers at risk for depressive symptoms (Beeber, Canuso & Emory, 2004). A mother's risk for depression is further amplified by the challenges of acculturation including acculturative stress, the weakening of protective cultural social supports, social marginality, and identity disintegration (Alderete, et al. 2000; Ortega, et al. 2000; Heilemann, Lee, & Kry 2002; Mosciki, Locke, Rae, & Boyd 1989; Vega, et al. 1998).

The primary factors that threaten to erode Latina maternal self-efficacy are maternal characteristics that limit post-immigration adaptability (e.g., young age, low education, poor physical health), factors that reduce the availability of social support or acculturation "mentors" (e.g., inability to work outside the home, frequent relocation) and family instability. Secondary factors are those that lead to family instability as indicated by family conflict. These include: (1) stressors associated with low income (e.g., worries about financial debts, limited transportation, interactions with police and social welfare workers); (2) low levels of acculturation to the U.S. (e.g., less time in the USA, low English language acquisition, and unfamiliarity with U.S. cultural and behavioral norms); and (3) maternal "burdens" that particularly challenge new mothers (e.g., having several children under the age of 6 or having a child with a learning disability or chronic health problem) (Knight, et al. 1994; Leadbeater & Bishop 1994; Flores, et al. 1999; National Council of La Raza 2001).

While the erosion of maternal self-efficacy puts mothers at risk for depression, the development of depressive symptoms places their children at developmental risk. We expect

depressive symptoms to increase parenting stress, promote dysfunctional parent-child interactions, and result in less supportive home environments. Although not evaluated in this study, these factors ultimately can lead to poorer child outcomes and validate the mother's sense of lowered self-efficacy. Many of these factors are amenable to psychiatric nursing intervention. Thus, results confirming this conceptual model would support the development of nursing interventions through EHS programs.

METHODS

Sample: Fifty seven Mexican mothers of Early Head Start infants or toddlers completed a standard screening instrument, the Center for Epidemiological Studies Depression (CES-D) scale as part of a screening procedure for a larger intervention study. The mothers were located in three Early Head Start sites in predominantly rural areas of the central Piedmont and the western mountainous region of North Carolina. After the initial screening, mothers were asked to participate in a two-hour data collection in their home. During this baseline data collection additional information was collected about the mother's socio-demographic characteristics, maternal behaviors, and the socio-emotional development of their children.

For twenty-six of these mothers scoring 16 and above on the CES-D (symptomatic), the two-hour, in-home interview comprised the baseline data collected prior to randomization into the intervention or control group for the intervention study. For the remaining thirty-one mothers who scored below 16 (asymptomatic), the interview was presented as providing descriptive data that would help the investigators better understand EHS Mexican mothers. These mothers consented to complete the same baseline interview in their homes as the mothers recruited into the larger study.

Mothers were required to be at least 15 years of age, not in regular (semimonthly or more frequent) psychotherapy or addiction therapy, and not on psychotropic medication. They were also required to have an EHS-enrolled child between 6 weeks and 30 months old. The average age of the EHS-enrolled child for mothers in our sample was 16 months. Although all the mothers who entered into this study are of Mexican origin this was not a specific component of the eligibility criteria. Approximately 61% of the Latino population in North Carolina is foreign-born and 65% is of Mexican-origin (U.S. Census, 2000). Moreover, only Latinas of Mexican origin were participating in North Carolina's EHS programs.

Procedure: Beginning in June 2003, all Spanish-speaking women enrolling in the 3 participating EHS program sites were asked if they would consent to completing the CES-D questionnaire. After completing the screening questionnaire, women were asked to participate in the baseline data collection and, if symptomatic for depression, the intervention study. Of the women screened, only 3 refused to participate and 5 were ineligible for participation. All questionnaires were read out loud in Spanish.

Mothers were offered two participation incentives. For completing the initial depression screening, they received a \$10 coupon to a local store of their choice. After completing the baseline data collection during the home visit, they received an additional \$10 coupon and a small gift. The completed baseline questionnaires were reviewed for errors and entered into a SAS database. A second verification entry was done and correlated with the original entry to ensure the accuracy of the data.

This project was approved by the Institutional Review Board of the University of North Carolina at Chapel Hill School of Nursing. Due to the limited reading abilities of some mothers, all consents were read aloud in Spanish and explained to the mothers. Mothers received a written

copy of the consents in Spanish. Mothers under 18 years of age gave assent and consent was given by a legal guardian.

Measurement: As outlined in our conceptual model (Figure 1), we evaluated inter-relationships between maternal self-efficacy, depressive symptom severity, and maternal-child interactions. In our models, we controlled for maternal socio-demographics and considered the effects of maternal social support, acculturation, maternal and other family burdens, general health status, and family conflict on our three main outcomes – self-efficacy, depressive symptoms, and maternal-child interactions.

Maternal Characteristics and Social Support. The key maternal characteristics controlled for in these analyses include maternal age and years of education. Other maternal characteristics obtained measure access to extrinsic resources which could alternatively be considered measures of social support (employment outside the home, no partner at home in the home, moved within the last year). Additional characteristics collected in the survey included religiosity, household size, income and participation in other public assistance programs. However, there was little variation in these variables and they were not used in this analysis. To be eligible to participate in EHS, mothers must have before tax income below 100% of the federal poverty level. Only one mother indicated that she was not religious. The vast majority of the mothers were catholic (88%). And, the average household included five persons with at least two adults and 3 kids.

Acculturation. Acculturation is not a unidimensional concept (Zane and Mak 2002). Accordingly, we measure three dimensions of acculturation – social acculturation, language acculturation, and psychological acculturation. Social acculturation pertains to experience and contact with the host culture and is measured by the maternal report of time spent in the U.S. Language acculturation pertains to language use and preferences and is measured with the 4-item

Marin Scale (Marin, et al. 1987). The four-item Marin scale has correlated highly with validity criteria such as respondents' generation, length of residence in the United States, and age at arrival in the United States (Marin & Marin 1991). Each item in the Marin scale is measured on a 5-point Likert scale (1= Spanish only...5=English only). The items are summed to create a measure that ranges from 4 (no language acculturation) to 12 (fully bilingual) to 20 (full language acculturation) The Marin scale had an excellent internal reliability in our sample ($\alpha=.87$) and was highly correlated with years in the United States ($\rho=.47$).

Measured by the Psychological Acculturation Scale (PAS), psychological acculturation reflects the cultural identity and values of respondents (Tropp, et al.1999). The 10-item Psychological Acculturation Scale (PAS) assesses the individual's sense of psychological attachment to and belonging within the Anglo-American and Latino/Hispanic cultures (Tropp, et al.1999). Each item is measured on a 3-point Likert scale where 1 indicates a primary Latino identity and 3 indicates a primary American identity. The sum of the items ranges from 10 (primary Latino identity) to 30 (primary American identity). Like the Marin scale, the PAS had an excellent reliability ($\alpha=.85$) in our sample. It was also highly correlated with language acculturation ($\rho=.48$) but not as strongly correlated with years in the U.S ($\rho=.15$).

Because our sample was highly homogenous with respect to acculturation, we dichotomized each of these acculturation measures to identify those at the extremes. Thus, years in the U.S was recoded as a dichotomous (1/0) variable indicating 10 or more years in the U.S. Language acculturation was recoded as a dichotomous (1/0) variable indicating no English skills when the sum of the Marin items equaled 4. Psychological acculturation was recoded as a dichotomous (1/0) variable indicating a strong Latino identity when the sum of the PAS items

was 10. Since these three measures of acculturation were highly correlated, we did not use them simultaneously in the same regression equations.

Maternal Burdens measure those factors associated with maintaining a child's well-being. Mothers experience more maternal burden when they have young children under the age of six who are not yet attending school full-time or when they have a child with a chronic health problem (e.g. asthma) or a learning disability. These two aspects of maternal burden are measured with indicator (1/0) variables.

Other Family Burdens were also identified in the survey. These included indicator variables for whether the mother needed to ask for a ride in the past month (transportation burden), whether the mother needed any help from the police, a lawyer, social workers, or any public agency in the past month (legal/social welfare burden), and whether the mother worried about financial debts several days per week (financial burden). Since not only the type of burden but the total amount of burdens a mother must contend with may be important, we also created an indicator variable that identified whether the mother experienced two or more burdens (i.e. child health, transportation, legal, or financial) during the past month.

Family Conflict was measured by 5 items from the Family Environment Scale. Respondents rate statements about how conflicts in their family on a 4-point ordinal scale. These statements are summed to yield a score ranging from 5 to 20 ($\alpha=.81$). Because this variable was highly skewed, in some regressions we dichotomize it to indicate high levels of family conflict when the family conflict score equaled 10 or more.

General Health Status. Self-reported health was measured using the standard question, "How would you describe your health in the last 3 months (1=poor, 2=fair, 3=good, 4=very good, 5=excellent). This single-item question has been used in many large national surveys and

has been found to be the single-best measure of general health status across a wide variety of population groups (Finch et al., 2002; McGee et al., 1999). Moreover, unlike other longer measures of general health status (e.g. the SF-12), this measure primarily reflects physical health status and not psychosocial factors related to illness or well-being (Makenbach et al. 2002).

Maternal Self-efficacy was measured by the General Self-Efficacy Scale (GES -Spanish version). This 20-item instrument measures perceived self-efficacy in coping with minor and major stressful life events and is designed to have 10 general items and 10 items added specifically for this study. The Spanish version of the 10 general items has been tested with Latino populations (Bäßler & Schwarzer 1996). The 10 specific self-efficacy items measure daily functioning with symptoms, management of life issues, use of social support, and parenting. These items were translated and back-translated into English and tested with mothers similar to the study mothers until equivalence was achieved. Respondents rate the statements on a 4-point ordinal scale. They are summed to yield a score ranging from 20 to 80 ($\alpha=.91$).

Maternal Depressive Symptom Severity is evaluated using the Center for Epidemiological Studies Depression Scale - Spanish version (CES-D) (Radloff 1977). Respondents rate symptom frequency in the previous week. Each item is scored 0 to 3, with total scores ranging from 0 to 60. Higher scores indicate greater depression severity. A score of 16 or above indicates clinically significant symptoms with a linear relationship between increasing scores and the likelihood of a diagnosis of major depressive disorder. Approximately 85% of respondents who score over 16 are presumed to have clinically significant depressive symptom severity (Vega et al. 1986). Because the CES-D has only one somatic depressive symptom item, the instrument is thought to be one of the most valid measures of depressive symptoms in Latino populations where somatic problems are over-reported and psychological problems are under-

reported (Vega et al. 1986). Previous studies of the instrument in both English and Spanish versions showed similar reliability and factor structure among Mexican-American, Black, and Anglos adults (Munet-Vilaro et al. 1999; Posner et al. 2001; Roberts 1980; Roberts et al. 1989). While some recent studies have found differences across ethnic groups (Perreira, et al. 2005; Guarnaccia 1989) our analysis is limited to a single ethnic group and issues of cross-ethnic measurement equivalence are less of a concern. In our sample of Latina mothers, the Cronbach's alpha was .84.

Maternal-Child Interactions were evaluated using the HOME Inventory and the Parenting Stress Index (PSI), Spanish version. The observer rated HOME Inventory (0-3) version was designed to identify children under 3 years old who are at risk for developmental delay due to a home environment lacking adequate stimulation. The HOME consists of 45 items arranged in 6 sub-scales. These sub-scales include: (1) verbal and emotional stimulation, (2) avoidance of restrictions and punishment, (3) organization of the environment, (4) provision of appropriate play materials, (5) maternal involvement, and (6) variety in daily stimulation. Each item is scored as present or absent, and the total score equals the number of present items with a range of 0 to 45. Higher scores indicate a more stimulating, affirming home environment. Biases in the HOME that have appeared to favor families with economic advantage were controlled for in this study by the inclusion of only low-income Latino families. In this study, the Cronbach's alpha was .83. This is well within the range (.70-.89) reported in previous studies (Caldwell & Bradley 1980; Tesh & Holditch-Davis 1997; Bradley, Whiteside, et al. 1994).

The short form (17-item) version of the PSI measures parental perceptions of stressors in the parent-child system. It has been used with parents of typical and special needs children and parents in highly stressful situations (Varia, Abidin & Dall 1966). In addition to obtaining a total

parenting stress score, the short form includes two subscales -- maternal stress and parent-child dysfunctional interactions. In the current study, the Cronbach's alpha was .88 for the total index; .83 for the maternal stress domain; and .87 for the parent-child dysfunction domain. These Cronbach alphas are slightly lower than those reported in previous studies (Loyd & Abidin 1985).

DATA ANALYSIS

Initial descriptive statistics for mothers in the sample were calculated (Table 1). We then estimated three sets of regressions to identify the domino effect hypothesized in our conceptual model. In the first set (Table 2), we focused on factors leading to a loss of self-efficacy. Using a logit model, we identified the primary risk factors for financial stress in our low-income immigrant families. Next, we used ordinary least squares (OLS) regression to identify the relationship between financial stress and family conflict. Finally, we regressed family conflict on general self-efficacy. In each new model, we controlled for the independent variables in the previous models.

In our second set of regressions (Table 3), we focused on factors influencing the development of depressive symptoms. For one of these factors – acculturation – we had three highly correlated measures. Therefore, we estimated this regression three times and used a different measure of acculturation in each model.

In our final set of regressions (Table 4), we identified to what extent depression results in increased total parenting stress (PSI) and the quality of the home environment. Using t-tests, we also evaluated unadjusted differences in mean scores on each sub-scale of the PSI and HOME for mothers with ($CES-D \geq 16$) and without ($CES-D < 16$) substantial depressive symptoms (Figure 2).

Because of the small sample size available for this study, we report statistical significance at the 10% level. When logit estimations have been used for bivariate outcomes, we report the coefficients and standard errors in the tables and odds ratios in the text. Odds ratios are obtained by exponentiating the logit coefficients. An odds ratio greater than one indicates an increased likelihood of an outcome. An odds ratio less than one indicates a decreased likelihood of an outcome.

RESULTS

Our hypothesized model of the domino effect begins with financial stress and family conflict that erode maternal self-efficacy. In the absence of social support, the erosion of maternal self-efficacy is expected to promote the development of depressive symptoms. Finally, the presence of depressive symptoms is hypothesized to reduce the quality of maternal-child interactions and the supportiveness of the home environment.

Financial Stress, Family Conflict, and Maternal Self-Efficacy

In our low-income sample of foreign-born Mexican women, worry or frustration with financial debt was most strongly associated with a lack of English language skills (Odds Ratio=4.42, $p<.05$). Poor English skills can hinder an immigrant women's ability to obtain a job and access public assistance services in the United States. Our results show that a woman's financial stress can be accentuated by the presence of children with chronic health problems and/or learning disabilities in the household. Families who have one or more children with a chronic health problem or learning disability are nearly three times more likely to report concerns about financial debt (Odds Ratio=3.19, $p<.10$). Maternal characteristics (i.e. age and

years of education) and social support had no significant association with the mother's sense of financial burden.

[INSERT TABLE 2 HERE]

Financial worries, in turn, were significantly associated with levels of family conflict reported by the mothers. The presence of financial burdens was associated with an average increase of 1.7 points on the family conflict scale (range: 5-20). A lack of English language abilities and the presence of two or more children under age 6 also exacerbated the potential for family conflict. Limited English skills can leave mothers socially isolated and without access to supportive resources outside of the home. The presence of young children can further exacerbate this sense of isolation while simultaneously increasing the demands on the mother's time. Other maternal burdens, maternal characteristics, and social support were not associated with higher family conflict scores.

While maternal characteristics and social supports had little influence on financial stress or family conflict, they were strongly associated with maternal self-efficacy. Notably, more education was associated with lower self-efficacy ratings. We suspect that this is due to the loss of social status that educated Latina women experience after moving to the U.S. Having a job outside of the home was also associated with a strong sense of maternal self-efficacy. While the ability to find and retain a job can be rewarding in its own right, work outside the home can also help women to develop social supports outside of the family and provide women with more financial independence from their families. Finally, as hypothesized, increasing family conflict levels reduced a mother's sense of self-efficacy. Thus, nursing interventions in EHS that can help families to reduce family conflict and the impact of stressors (i.e. no work outside the home,

no English skills, young preschool aged children, and children with health problems or learning disabilities) associated with family conflict can potentially improve maternal self-efficacy.

Depressive Symptoms

Having established the link between financial worries, family conflict, and maternal self-efficacy, we move next to examining the relationship between maternal self-efficacy and depressive symptoms. Though the causal direction cannot be confirmed with our cross-sectional data, maternal self-efficacy explained 31% of the variance in CES-D scores (results not shown). Adding family conflict to the regressions increased the explained variance to 49%.

The remaining factors (i.e. social support, multiple family burdens, and acculturation) hypothesized to affect depressive symptoms in foreign-born Mexican mothers were not nearly as influential as self-efficacy and family conflict. In general, more acculturation to the U.S. was associated with lower CES-D scores. However, only the relationship between CES-D scores and psychological acculturation was significant. The presence of multiple family burdens (i.e. child health/learning problems, financial worries, transportation needs, or legal/social service assistance needs) also approached significance in each model. Thus, our data continue to support the hypothesis that women will cascade towards depression as maternal burden and family conflict reduce maternal self-efficacy.

[INSERT TABLE 3 HERE]

Maternal and Child Interactions

The final link in our domino effect is between depression and maternal-child interactions. In bivariate analyses (Figure 2), we found significantly higher levels of maternal distress and dysfunctional parent-child interactions among depressed ($CES-D \geq 16$) mothers than among non-depressed ($CES-D < 16$) mothers. We also found that depressed mothers reported a significantly

less stimulating and affirming home environment than non-depressed mothers. The aspects of the home environment that varied most strongly by depressive symptoms were verbal/emotional stimulation and maternal involvement.

[INSERT FIGURE 2 HERE]

As shown in our regression analyses (Table 4), these associations continued to be strong when adjusted for potential confounders such as maternal burden, self-efficacy, family conflict, and acculturation. With the exception of maternal burden, all other factors only have indirect associations with maternal and child interactions *through* their effects on depression.

[INSERT TABLE 4 HERE]

DISCUSSION

Among children under age 18, Latinos are the fastest growing ethnic group in the United States (Hernandez 2005). Currently, 21% of the total U.S population under age 5 is of Latino heritage (U.S. Census 2005a; U.S. Census 2005b). The vast majority (65%) of these young Latino children lives in a family of Mexican origin and more than 1 in 5 has at least one foreign-born parent (U.S. Census 2003; Hernandez 2005).

Previous research has shown that the lifetime prevalence of depressive symptoms is higher among Latinos than either non-Hispanic Whites or African Americans (Golding & Burnam 1990; Kessler 1994; Frerichs, Ansehensel, & Clark 1981; Rickert, Weimann & Berenson 2000). Overall, however, the evidence that Latinos are at higher risk for depression than other population groups is inconclusive (Vega & Rumbaut 1991). Results vary across studies due to differences in the instruments used to identify depressive symptoms, modes of administration, and regional differences in the populations sampled. Among Latinos there are significant differences in the lifetime prevalence of depression and other psychiatric disorders by

country of origin (e.g., Mexico, Puerto Rico, or Cuba), immigrant status or nativity, and acculturation to the U.S. (Vega & Rumbaut 1991; Ortega et al. 2000; Alderete et al. 2000).

In this study, we focused on a distinct subpopulation of Latinos – foreign-born, low-income Mexican women with young children. As part of a larger intervention study, we identified the primary factors that influence the development of depressive symptoms in these women and the association of these symptoms with maternal-child interactions. The relationships identified in this study will assist in the creation of EHS services that help mothers reduce their depressive symptoms. By reducing their symptoms, mothers could more fully use the resources of EHS to facilitate the process of acculturation and, ultimately, nurture strong, well-adjusted children.

Studies of depressed mothers' parenting interactions have included few Latina mothers and attention is just beginning to be paid to the way in which imbedded cultural values about childrearing practices might shape mothers' interactions. Especially while interacting with toddlers, parents of different cultures relay different values regarding achievement, deference to authority, individualism, collectivism and locus of control (Pachter & Harwood 1996; Harwood, et al. 1999). Although some of the characteristics of the depressed mother are universal enough to be meaningful across many cultures, consideration of cultural values affecting mothers' interactions is needed to accurately interpret the impact of depressive symptoms on mothering.

[INSERT FIGURE 3 HERE]

This analysis has begun that process. Figure 3 distills the essential empirical findings of our research. We find evidence of a domino effect where increases in stressors such as child health or learning problems can lead to financial worries for the family. These financial concerns subsequently accentuate family conflict. Family conflict, combined with a lack of

social support and acculturative stresses associated with a loss of social status (or social marginality) in the U.S., reduces a mother's sense of self-efficacy. This erosion of maternal self-efficacy combined with high levels of family conflict and low psychological acculturation places the mother at high risk of developing depressive symptoms. These depressive symptoms interfere with the mother's ability to develop a supportive environment for her infant/toddler and to socialize her infant/ toddler.

Psychiatric nurses working through Early Head Start (EHS) programs are in a critical position to intervene with mothers at risk for depression. Working through EHS, nurses can serve as "acculturation mentors" for immigrant Latina mothers and provide them with the skills needed to reduce the stresses of acculturation, manage family conflict, and improve their maternal self-efficacy. These skills can have a lasting impact on their risk of developing depression and on the socio-emotional development of their infants and toddlers.

Limitations: Given the cross-sectional design and small sample size, our results are suggestive but not conclusive. The model developed in this study will need to be reassessed using a larger, longitudinal sample and structural equation techniques. In addition, future studies would benefit from the inclusion of videotaped mother-child interactions. While self-reports and home observations are suggestive, videotaped observations can provide more insight into maternal-child behaviors and improve the external validity of the findings. Finally, to develop a stronger sense of cultural values, parenting practices, and acculturation experiences in the United States, we recommend that future studies be complemented by in-depth qualitative interviews with women. To better serve immigrant Mexican and other Latina women, we must hear their voices and see depression and its effects on child rearing through their own eyes.

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Figure 1. Conceptual Model of Depression and Infant/Toddler Socio-Emotional Health

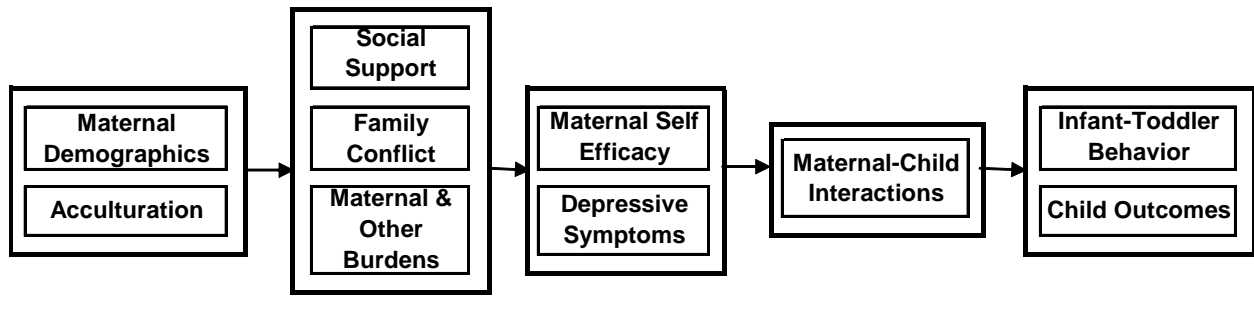


Table 1. Sample Characteristics (N=57)

	Mean/%	(s.d.)
Socioeconomic Background		
Mother's age	27.47	(5.34)
Years Education	8.79	(2.78)
Social Support		
Works outside home	26%	
Multiple Adults (age 18+) in household	95%	
No spouse/partner at home	9%	
Moved last year	35%	
Acculturation		
Years in U.S.	5.93	(3.86)
10+ Yrs in U.S.	12%	
No English skills (Marin=4 of 20)	67%	
Strong Latino Identity (PAS=10 of 30)	37%	
Maternal Burden		
EHS Child's age (months)	16.28	(10.65)
Child Health/Learning Problem	32%	
2+ Kids under age 6	60%	
Other Burdens		
Often worries about financial debts	39%	
Needed transportation aid last month	39%	
Needed legal aid last month	9%	
Multiple burdens	35%	
Family Conflict		
Family Conflict (5-20)	8.09	(3.23)
High Family Conflict (>=10)	21%	
Self Reported Health (1=poor...5=excellent)		
General Self-Efficacy (20-80)	2.77	(1.07)
	59.25	(12.59)
Mental Health		
CES-D score	16.60	(14.73)
CES-D -score > 16	46%	
Maternal and Child Behavior (0-4 years)		
Modified Parental Distress Score (PSI)	14.67	(5.14)
Parental-Child Dysfunctional Interaction (PSI)	21.86	(7.22)
Modified Total Stress Score (PSI)	36.53	(10.64)
HOME (verbal & emotional)	9.53	(1.95)
HOME (avoidance of restrictions & punishment)	5.98	(1.23)
HOME (organization of environment)	4.98	(0.86)
HOME (play materials)	6.96	(1.75)
HOME (maternal involvement)	4.61	(2.02)
HOME (variety)	3.35	(1.41)
Total HOME Score	35.42	(5.98)

Table 2. Regression Results on Financial Burdens, Family Conflict, and Maternal Self-Efficacy

	Financial Stress		Family Conflict		Self-Efficacy	
	Beta	(s.e.)	Beta	(s.e.)	Beta	(s.e.)
Maternal Demographics						
Mother's Age	-0.01	(0.06)	-0.03	(0.08)	0.57	(0.28) *
Years Education	0.07	(0.12)	0.10	(0.17)	-1.85	(0.57) ***
Social Support						
Works outside home	-0.15	(0.65)	1.21	(0.95)	11.07	(3.19) ***
Moved last year	-0.03	(0.66)	-1.45	(0.94)	0.73	(3.17)
Acculturation						
Speaks no English	1.49	(0.76) **	1.97	(1.06) *	-2.76	(3.67)
Maternal Burden						
Child Health/Learning Problem	1.16	(0.63) *	-1.30	(1.02)	-2.05	(3.41)
2+ Kids under age 6	-0.17	(0.61)	1.55	(0.91) *	-0.54	(3.09)
Other Burdens						
Often worries about financial debts	---	---	1.72	(0.91) *	-0.63	(3.11)
Needed transportation aid last month	---	---	-0.87	(1.01)	-4.10	(3.34)
Needed legal aid last month	---	---	1.81	(1.76)	-2.85	(5.90)
Self-Reported Health						
	---	---	---	---	2.37	(1.48)
Family Conflict						
	---	---	---	---	-1.06	(0.50) **
N		57		57		57
Pseudo R²/R²		0.10		0.26		0.49

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

Note: Financial worry equation is estimated using a logit. Family conflict and self-efficacy equations are estimated with OLS.

Table 3. Regression Results on CES-D

	Model 1		Model 2		Model 3	
	Beta	(s.e.)	Beta	(s.e.)	Beta	(s.e.)
Maternal Demographics						
Mother's Age	-0.49	(0.30)	-0.52	(0.27) *	-0.49	(0.26) *
Years Education	0.06	(0.55)	0.35	(0.60)	0.26	(0.54)
Social Support						
No Partner at Home	8.28	(5.31)	7.32	(4.96)	8.29	(4.80) *
Multiple Adults at Home	---	---	---	---	---	---
Multiple Family Burdens						
	6.42	(3.05) **	5.45	(3.02) *	5.18	(2.90) *
Family Conflict						
	1.86	(0.46) ***	1.76	(0.46) ***	1.91	(0.44) ***
General Self-Efficacy						
	-0.41	(0.13) ***	-0.40	(0.13) ***	-0.38	(0.12) ***
Acculturation						
10+ Yrs in U.S.	-1.32	(5.13)	---	---	---	---
No English skills	---	---	4.01	(3.40)	---	---
Strong Latino Identity	---	---	---	---	5.93	(2.83) **
N		57		57		57
R²		0.57		0.58		0.61

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

Constant not shown.

Figure 2. Maternal and Child Behavior Differences, by Depressive Symptoms

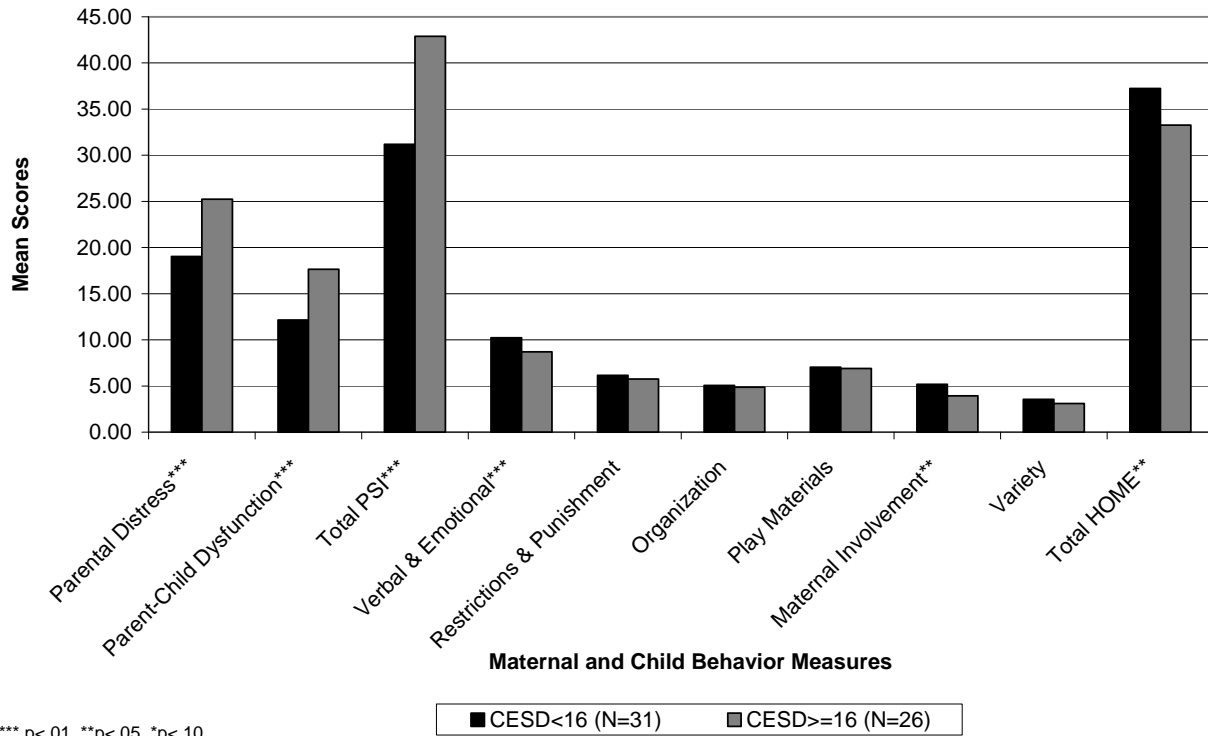


Table 4. Regression Results on Maternal and Child Behavior

	Total Parenting Stress (PSI)		Total HOME	
	Beta	(s.e.)	Beta	(s.e.)
Multiple Family Burdens	25.97	(11.98)	**	-2.21 (1.69)
High Family Conflict	2.18	(2.99)		-0.68 (1.95)
Speaks No English	1.78	(2.63)		-0.16 (1.72)
General Self-Efficacy (GSE)	-0.03	(0.12)		-0.07 (0.07)
GSE*Maternal Burden	-0.44	(0.20)	**	---
Depressed (CES-D>=16)	10.33	(3.12)	***	-5.55 (2.05) ***
N	57		57	
R²	0.35		0.20	

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

Constant not shown. All regression control for maternal age.

Figure 3. Empirical Model of Depression and Infant/Toddler Socio-emotional Health

