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Acculturation, Self-Efficacy and Breastfeeding Behavior in a Sample of Hispanic Women

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by

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Abstract

Breastfeeding confers immunological, physiological and psychological benefits for the infant and mother as well as social and economic benefits to the nation. The United States Department of Health and Human Servcies (HHS), Healthy People 2020 has established national objectives for the initiation and duration of breastfeeding at 82% initiation, 61% at six months and 34% at one year. In addition, they have set goals for exclusive breastfeeding at 3 months to be 46% and 25% at 6 months of infant's age. Currently breastfeeding initiation is at the highest recorded level of 76.9%, yet significant disparities exist (CDC, 2012). The purpose of this study was to examine the association of acculturation and self-efficacy on breastfeeding behavior of a sample of Hispanic women. Initially the plan was to focus on women from Mexican, Cuban and Puerto Rican countries of origin. However recruitiment goals for only the Mexican population were reached. Two valid and reliable bidimensional instruments were used in addition to collecting contextual information to foster a more comprehensive understanding of the acculturation process. The roles of self-efficacy and social support and their relationship with acculturation measures and breastfeeding behavior was explored. The Non-Hispanic domain subscale of the Bidimensional Acculturation Scale scores were significantly different for those breastfeeding compared to those formula feeding, indicating higher levels of Non-Hispanic domain acculturation associated with not breastfeeding. Acculturation and self efficacy (general and parental) were not found to be related. Breastfeeding outcomes and parental self-efficacy were found to have a significant negative correlation, a finding that was in an unexpected direction, with higher parental self-efficacy associated with decreased breastfeeding intensity.

Mixed feeding or Las Dos, is a common finding among Hispanic women especially for the Mexican origin community and exclusivity may not have been perceived as higher value then mixed feeding or formula feeding (Bunik et al., 2006). Rates for exclusive breastfeeding at three months are 33% for both the US as well as for Hispanic/Latino ethnicity (National Immunization Survey, 2007). At six weeks the practice of exclusively breastfeeding (not giving formula) was 17% and this is about half of the 46% goal set for exclusive breastfeeding at three months by (HHS) Healthy People 2020. Of those that were exclusively breastfeeding in the hospital only three were still exclusively breastfeeding at the six week follow up call. This presents a unique opportunity in which targeting Hispanic mothers after discharge may assist in increasing further the rates of exclusive breastfeeding and recommendations are provided.

Chapter One: Introduction

The benefits of breastfeeding have been well documented and it is considered the "gold" standard for infant feeding. Breastfeeding confers immunological, physiological and psychological benefits for the infant and mother as well as social and economic benefits to the nation (American Academy of Pediatrics, 2012). The United States Department of Health and Human Services (HHS), Healthy People 2020 (2013), has increased their established national objectives for the initiation and duration of breastfeeding at 82% initiation, 61% at six months and 34% at one year. Healthy People 2020 also have established national objectives for the practice of exclusive breastfeeding to be 46% at 3 months and 25% at 6 months of infant's age. The World Health Organization has calculated that promoting exclusive breastfeeding has the potential to reduce 13% of all deaths under 5years of age (World Health Organization (WHO) (WHO, 2000). Recently, Bartick & Reinhold have estimated that if 90% of the US population would comply with recommendations to exclusively breastfeed for 6 months, 13 billion dollars could potentially be saved every year and 911 infant deaths prevented (Bartick & Reinhold, 2010).

Hispanics are the largest growing minority group in the United States and consist of diverse ethnic groups. Research has found higher rates of breastfeeding in the United States to be associated with higher educational attainment and higher incomes (Dennis, 2002). In the United States breastfeeding rates of Hispanic women have been found to be as high as those of non-Hispanic white women (CDC, 2013). Yet, Hispanics in the United States have similar

educational attainment and poverty rates to Non-Hispanic Blacks. Why is it then that Non-Hispanic Blacks have the lowest rates of breastfeeding if Hispanics in the United States share similar demographic characteristics? This occurrence is puzzling to many and points to the possible influence of acculturation on breastfeeding practices among Hispanic women in the United States.

Previous research on acculturation and breastfeeding practices of Hispanic women has focused on women of Mexican and Mexican-American origin and utilized proxy measures of acculturation. The value afforded to breastfeeding in the country of origin is an important factor that should be considered when measuring the effect of acculturation on breastfeeding practices of Hispanic women in the U.S. In Mexico rates of breastfeeding have been historically high and this may influence women of Mexican origin by making breastfeeding a natural choice even when residing in the U.S. On the other hand, Puerto Rico has lower breastfeeding rates then countries such as Mexico and Cuba (Leavitt, 2009). Stark differences do exist in the political, social and economic climates between Puerto Rico, Mexico and Cuba which continues in the U.S. with varying immigration status and assistance provided by the government upon arrival. Research that takes into account the country of origin may help to elucidate further the effect of acculturation on breastfeeding practices of Hispanic women in the U.S. With subsequent generations and the process of acculturation, a shift in infant feeding practices from breastfeeding to the more "Americanized" form of bottle feeding has been documented for Hispanic women in the U.S (Celi, Rich-Edwards, Richardson, Kleinman, & Gillman, 2005).

Study Aims and Research Questions

The purpose of this study was to examine the association of acculturation and self-efficacy on breastfeeding behavior among a sample of Hispanic women residing in Florida. It originally was designed to focus on women from Mexican, Cuban and Puerto Rican ethnicity. Acculturation research has been critiqued for utilizing spoken language as the primary indicator and in some instances the only one of acculturation, failing to acknowledge if the behavior studied is prevalent in the countries of origin and, finally, for not controlling for the impact of education or socioeconomic status (Hunt, 2004). In the study acculturation was measured using two valid and reliable bidimensional instruments in addition to collecting contextual information to foster a more comprehensive understanding. The role of self-efficacy and social support and relationships between acculturation and breastfeeding behavior was explored.

The original aims of the dissertation research were:

AIM 1: To assess the relationship between acculturation and breastfeeding behaviors.

- To what extent are breastfeeding behaviors correlated to acculturation levels?

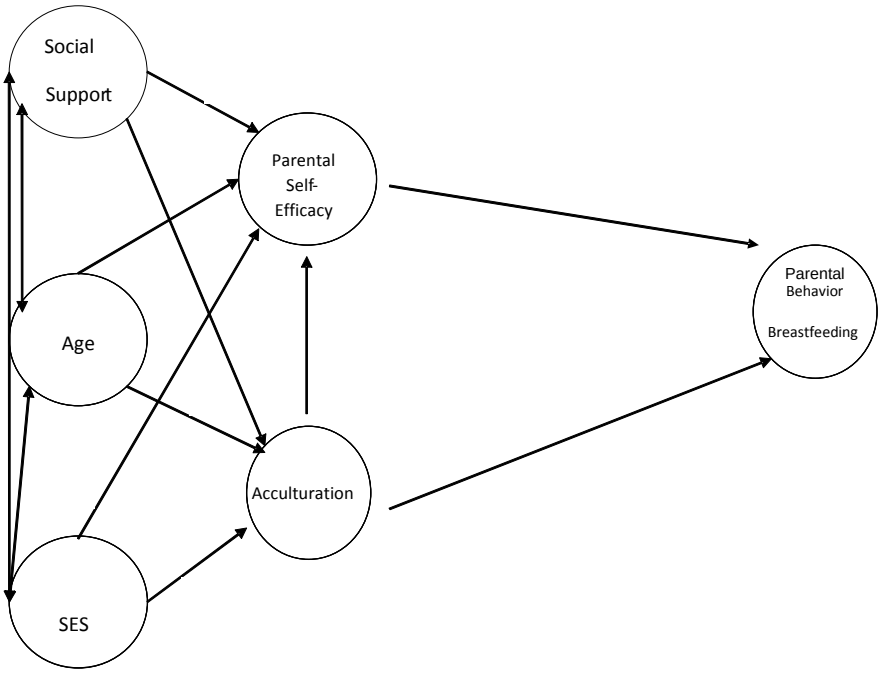
AIM 2: To assess the plausible mediating role of parental self-efficacy between acculturation and parental behaviors, specifically breastfeeding behaviors.

- Does parental self-efficacy correlate with acculturation levels and breastfeeding behaviors?
- Does parental self-efficacy mediate the role between acculturation and breastfeeding behaviors?

AIM 3: To assess the relationships among social support, age and socioeconomic status (SES) on the mediating role of parental self-efficacy between acculturation and parental behaviors specifically breastfeeding behaviors.

- What are the relationships between social support, age and SES, self-efficacy, and breastfeeding behaviors?
- To what extent do the relationships between social support, age and SES affect the mediating role of parental self-efficacy between acculturation and parental behaviors specifically breastfeeding behavior?

These possible relationships are diagramed in the figure below:



(Figure 1: Relationships of Acculturation, Self-Efficacy and Breastfeeding Behavior)

Definitions

1. Breastfeeding occurs when an infant is fed at the breast or receives expressed breast milk.
2. Exclusive breastfeeding is defined as an infant receiving feeds of breast milk without supplementation of water, juice, formula or other foods, except for vitamins, minerals or medications (WHO, 2008; Kramer & Kakuma, 2002).
3. Hispanic/Latino is a person who self identifies as being of Hispanic or Latino origin. Latina refers to women.
4. Acculturation is the process by which individual or group cognitions and behaviors change as a result of contact with other cultural groups (Berry, 1997).
5. Biculturalism describes identification with more than one culture. A person who is bicultural has some competence in more than one culture at a time. Adherence to both the culture of origin and dominant culture is a fluid process that may not be equal and is dependent on the individual. Developing bicultural competence or bicultural efficacy involves acquiring knowledge of both cultures (LaFromboise, Coleman, & Gerton, 1993).
6. Ethnicity pertains to cultural traditions, prescribed norms values and a heritage that persists beyond generations (Helms, 1996).
7. First generation describes a person who arrived in the U.S. after age 12 and is foreign born.
8. 1.5 generation describes children who are foreign born and arrived in the U.S. between the ages of five years and adolescence, as they will have similar experiences to their siblings born in the U.S. in regards to schooling and socialization (Gonzales-Berry,

Mendoza & Plaza, 2006). 1.5 generation will be defined for the study as foreign born and arriving to the U.S. before the age of 12years.

9. Second generation describes a person who was born in the U.S., and has at least one parent who is foreign born.
10. Third generation describes a person who was born in the U.S. to parents that were also born in the U.S. (Native-born)
11. Self-efficacy is a person's belief about her capabilities to perform a specific task or behavior (Bandura, 1997). Self-efficacy is acquired from four principle sources: performance accomplishments, vicarious experiences, verbal persuasion and physiological states (Bandura, 1997).
12. Parental self-efficacy is the confidence a new mother or father has in their ability to meet the demands and responsibilities of parenthood (Reece, 1992).
13. Breastfeeding self-efficacy is a mother's confidence in her ability to successfully breastfeed her infant (Dennis, 1999).

Chapter Two: Review of Relevant Research

Nutrition plays a highly important role in achieving maximum health. Infancy is a time period in which nutritional demands are exceptionally high due to rapid growth and development. Human milk is the most digestible infant food and provides the closest match to the nutritional needs of infancy (American Academy of Pediatrics (AAP), 2012). Breast milk is not just the optimal form of nutrition but the highest standard for infant feeding. The World Health Organization (WHO) has created growth charts based on optimal infant feeding practices and used international data from infants who were predominately breastfeed for at least four months and that continued breastfeeding for 12 months (CDC, 2010). The WHO growth charts represent the standard of growth and the CDC recommends using these growth charts for newborns until two years of age (CDC, 2010).

The composition of human milk is dynamic and adjusts to the infant's needs compared to formula which is static as manufactured. Current use of advanced technological screening procedures has provided further scientific evidence that human milk is a "complex substance", with a unique composition and a host of protective functions (Neville et al., 2012). The Enteromammary pathway has been provided as a model of how breastfeeding provides specific immunological support for each mother and infant dyad (Brandtzaeg, 2003). The act of breastfeeding serves as the stimulus for the mother's body to produces specific antibodies targeted against the antigens the infant has been exposed to and these antibodies are then transferred to the infant via breast milk (Brandtzaeg, 2003). Breast milk provides a daily dose of immunological support that is targeted for that mother and infant dyad (Brandtzaeg, 2003). The

three phases of human milk form a continuum and they are colostrum, transitional milk and mature milk. Colostrum is accumulated in the breasts approximately around the 20th week in pregnancy and is readily available for the infant at birth until about the fifth day of life. The role of colostrum is protective and it provides the highest concentration of secretory immunoglobulin A, lactoferrin and human milk oligosaccharides (Lawrence & Lawrence, 2011). Colostrum is characterized by smaller volumes and has a yellowish color and thicker consistency with reported volumes of 100 ml in the first 24 hours (Lawrence & Lawrence, 2011) The next phase is transitional milk which occurs from seven days to two weeks postpartum and is marked by an increase in levels of lactose, water soluble vitamins, fat and total calories and reaching daily volumes of 500 ml by end of second week (Lawrence & Lawrence, 2011). This is the time point in which most women report their milk has come in and the onset of copious milk or lactogenesis II occurs. The final stage is of mature milk and great variations exists in regards to volumes consumed during feedings, day and night cycles as well as among individual mothers regarding total milk calories as well as levels of docosahexaenic acid (DHA) fatty acids (Lawrence & Lawrence, 2011).

Weaning or complete cessation of breastfeeding has been documented to occur on average at 3-4 years with the range of 2- 5 years in primitive cultures (Lawrence & Lawrence, 2011). In the U.S. data on breastfeeding beyond the first year of life is scarce. Dettwyler conducted a survey of mothers who had breastfed longer than 3 years and over a five year time period (1995 to 2000) collected data on 1250 children (Dettwyler, 2004). The average age of weaning in this sample was found to be 4.24 years with a range from 3 to 9 years; the sample

was homogenous and consisted of women from European-American ethnicity with high levels of education and income (Dettwyler, 2004). The sample described above is not representative of the national U.S. demographics and further research regarding the process of weaning is needed.

Health Benefits of Breastfeeding

The health advantages of breastfeeding have been demonstrated by research and span nutritional, developmental, psychological, immunological, social, economic as well as environmental benefits (Gartner, 2005). Breastfeeding is associated with a decrease in the incidence as well as severity of infectious disease (Heinig, 2001), decreased rate of sudden infant death syndrome (McVea, 2000; Morgan, Groer & Smith, 2006), reduction in the incidence of diabetes (Knip,2005; Young, 2002), decreased incidence of certain cancers (Schack-Nielsen, Larnkjaer, & Michaelsen, 2005), decreased incidence of overweight and obesity (Dewey, 2003; Grummer-Strawn & Mei, 2004), decreased incidence of asthma (Oddy, 2004), and improved neurodevelopment (Mortensen, 2002). The Agency for Health Care Quality and Research (AHRQ) published a systematic review of breastfeeding and maternal and infant health outcomes in developed countries (Ip et al., 2007). Maternal health benefits include a decreased risk of breast and ovarian cancers and decreased risk of type II diabetes, and early weaning or not breastfeeding was associated with an increased risk of postpartum depression (Ip et al., 2007). A negligible effect of breastfeeding on return to pre-pregnancy weight was identified and effect on postpartum weight loss was unclear. Overall, exclusive breastfeeding and longer durations are associated with improved maternal and infant health outcomes.

AHRQ's findings verified the health risks with feeding formula and early weaning from the breast and presented the excess health risks associated with not breastfeeding (Ip et al., 2007). Formula feeding was found to be associated with increased risks of major chronic

diseases such as type 2 diabetes (64%), asthma (67%, with family history) and childhood obesity (32%) (Ip et al., 2007). Overweight and obesity are detrimental health states, which lead to chronic diseases. The prevalence of obesity with impaired glucose tolerance and gestational diabetes is two to four times higher in Mexican-American than in non-Hispanic white women (Ferrara, Kahn, Quesenberry, Riley & Hedderson, 2004). Obesity is a risk factor for gestational diabetes (GDM) and women with GDM and their children are at a higher risk of developing diabetes in the future (Fitzgerald et al., 2006). Analysis of two large U.S. cohorts of women found an association between a longer duration of breastfeeding and a reduced incidence of type 2 diabetes (Stuebe et al., 2005). Meta analyses have found that breastfeeding has a small but consistent protective effect against obesity in children (Arenz & von-Kries, 2005). Li and colleagues conducted an examination of maternal prepregnancy obesity and lack of breastfeeding in a large cohort in the U.S. and found children of obese mothers who did not breastfeed to be at the greatest risk of becoming overweight (OR 6.1, $p < .05$) (Li et al., 2005).

Current Breastfeeding Practices

The initial days of the postpartum period are critical to ensure the establishment of successful breastfeeding, to avoid excessive infant weight loss (> 10%), and to increase overall duration of breastfeeding. The United States Department of Health and Human Services (HHS, 2013), Healthy People 2020 have established national objectives for the initiation and duration of breastfeeding. Table 1 provides the Healthy People 2020 objectives for comparisons with the national, state and local county breastfeeding rates. The state of Florida breastfeeding rates are below the national rates for all five measurements and have will require significant improvement to achieve the HP 2020 objectives (CDC, 2013a). The largest discrepancy is seen in the rates

provided by WIC office's in which the initiation of breastfeeding at 78% drops to only 9% for exclusive breastfeeding at three months (HCBFTF, 2011).

Table 1: Healthy People 2020 Objectives and National and Local Breastfeeding Rates

	Ever Breastfeed	Breastfed at 6 months	Breastfed at 12 months	EBF at 3 months	EBF at 6 months
Healthy People 2020 Objectives	81.9%	60.6%	34.1%	46.2%	25.5%
US National	76.5%	49%	27%	37.7%	16.4%
Florida	71.8%	40.9%	20%	32.1%	14.6%
Hillsborough County					
Hospitals*	82%				
WIC	78%			9%	

Note: US National = CDC National Immunization Survey results and for the state of Florida (CDC, 2012). Hillsborough County rates provided by Hillsborough County Breastfeeding Task Force and Hillsborough county WIC offices. EBF= Exclusive Breast Feeding

Nationally an increase in breastfeeding rates from 2000 to 2008 has been identified, yet disparities between breastfeeding rates of minority women persist, with Black women having the lowest rates overall, (58.9% for Black women compared to 75.2% for White women and 80% for Hispanic women for any breastfeeding), (CDC, 2013b).

In 2007, HHS Healthy People 2010 added the national goal of 40% exclusive breastfeeding at 3 months of infant's age and 17% at 6 months of infant's age (HHS Healthy People, 2006). Most recently HHS, Healthy People 2020 has increased goals to 46% for exclusive breastfeeding at 3 months and 25% at 6 months of infant's age (HHS, Healthy People 2020, 2013). During exclusive breastfeeding an infant receives no other liquid than breast milk or solid food, other than vitamins or medications (Labbok & Krasovec, 1990, WHO, 2008). Exclusive breastfeeding for the infant's first six months of age is considered the optimal duration and the introduction of complementary foods and continued breastfeeding thereafter has been recommend (Gartner,

2005; Kramer & Kakuma, 2002). Current rates of exclusive breastfeeding in Florida are also below the national rates as presented in Table 1 above (CDC, 2013a).

Exclusive breastfeeding practices nationally are poor overall and ethnic disparities are evident even during the initial hospitalization. Petrova and colleagues focused on the association between in hospital feeding method and the one month feeding method (Petrova, Hegyi, & Mehta, 2007). Their sample consisted of 307 women with a makeup of 57.1% White, 10.1% Black, 20.5% Asian and 15.3% Hispanic. They did not distinguish between the countries of origin in their sample or collect information on length of stay in the U.S. Demographic data were collected and variables that showed statistical significance differences among the race/ethnic groups were included in the logistic regression model. Exclusive breastfeeding (EBF) rates in the hospital was practiced by 54.2% of White, 38.7% of Black, 54% of Asian, and 44.7% of Hispanic women. At one month of those that were EBF in the hospital only 55.7 % White, 50.0% Black, 58.9% Asian and 19.1% for Hispanic were still EBF (Petrova et al., 2007). Using logistic regression analysis, regardless of race/ethnicity women that were EBF during the hospital stay were 7.2 times more likely to be EBF at one month (Petrova et al., 2007). The mothers who practiced either partial or no breastfeeding in hospital were found to have even lower rates of exclusive breastfeeding, 10.5%, 15.8%, 20.7% and 3.9% for White, Black, Asian and Hispanic groups (Perova, et al., 2007). This study demonstrated that women who practice EBF in the hospital are more likely to EBF at one month postpartum. Hispanic women had the largest drop in the continuation of EBF and the lowest rate of EBF at one month postpartum.

The Theory of Planned Behavior (TPB) is based on the intention to perform a behavior and consists of three theoretical constructs, attitude to act, subjective norm and perceived behavioral control. Bai and colleagues used the TPB to explore intentions of mothers to continue to

exclusively breastfeed (EBF) for the duration of six months (Bai, Wunderlich & Fly, 2011). They found 50.2% of the variance in the mothers intention to continue to EBF for six months explained by attitude, subjective norm and perceived behavioral control, with racial/ethnic differences identified (Bai, Wunderlich & Fly, 2011). The three constructs explained 65%. 47.2% and 50.5% of the variance in intention to EBF for 6 months for the Hispanic women, African American and White women, respectively (Bai et al., 2011). Hispanic women in the sample identified the perceived behavioral control belief to be of the greatest importance and reported it as the control belief of pumping breast milk. Among non-Hispanic African American women support from family and friends was valued highly and increasing positive attitudes towards EBF was reported by the non-Hispanic White women (Bai et al., 2011). Recommendations are provided by the authors for interventions to increase EBF based on TPB outcomes and differences in relevance of constructs for the women.

Consistent predictors of breastfeeding include older maternal age, higher socioeconomic status, ethnicity, smoking status and employment (Dennis, 2002). Breastfeeding rates in the U.S. are lowest among African Americans and socioeconomically disadvantaged women (Li & Grummer-Strawn, 2002). Low income women have been found to be more likely to return to work earlier and to jobs that may not be flexible enough to incorporate the practice of breast milk pumping (Fein & Roe, 1998; Kimbro, 2006). Full time employment requires the mother to pump to sustain her supply while separating the mother and infant for long periods of time.

Lack of social support can affect the establishment of a successful breastfeeding relationship. A woman's attitudes regarding forms of infant feeding is developed with exchanges of information from sources of support (Humphreys, Thompson & Miner, 1998). The type or

source of support may be positive or negative depending on the perception of the woman. For example if a woman intends to breastfeed and her mother is a source of her support system, her mother's attitudes and past experiences with breastfeeding will influence the support provided. Lay support has been found to be important especially among low income women even when compared with professionals' attitudes (Humphreys et al., 1998). In addition, a mother who has young children in the home has limited time and restraints.

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is the largest purchaser of formula in the U.S. (Victo, Frazão & Smallwood, 2011). At the same time WIC also reports to be supportive of breastfeeding. This dual role of WIC can be confusing to participants and sends a mixed message to the community. WIC participants can be classified as a vulnerable population needing breastfeeding support as they are low income pregnant, postpartum and breastfeeding women and children under the age of 5 (Baumgartel & Spatz, 2013). Breastfeeding rates of WIC participants have been historically low and recently a trend in an increasing divide between breastfeeding rates of WIC participants and non WIC participants has been identified (Baumgartel & Spatz, 2013). WIC's spends 25 times more money on formula than on breastfeeding children even when the formula rebate savings is included (Baumgartel & Spatz, 2013). The contracted formula company for WIC provides a rebate offer in which an estimated 15% of actual cost of formula is paid by WIC (Victor, Frazão, & Smallwood, 2011). These WIC families will tend to purchase the same formula once their monthly formula vouchers provided by WIC are depleted, but they will purchase it from local stores at 100% cost, profiting the formula companies. Lack of consistency between breastfeeding support as stated in WIC policies and current allocation of funding that benefits formula has been addressed by the American Academy of Nursing Expert Panel on

Breastfeeding and they recommend reallocating the WIC budget to improve funding for peer counseling programs that are effective and support breastfeeding for this vulnerable population (Baumgartel & Spatz, 2013). WIC services have great outreach and potential to impact positively breastfeeding practices of this vulnerable population in the U.S. if they provide funding and resources to utilize peer counseling programs to their fullest.

The breastfeeding culture in the countries or territories of origin may be reflected in the breastfeeding practices of Hispanic subgroups in the U.S. (Perez-Escamilla & Putnik, 2007). The value or worth given to breastfeeding may differ among Hispanic ethnicities. If the mother was raised and educated in a country in which breastfeeding is commonly practiced then breastfeeding may come as a natural choice. This exposure may have prepared the mother to feel confident in her ability to breastfeed. Looking at breastfeeding rates for countries such Mexico may provide information on the incidence and potential impact of country of origin on breastfeeding practices of Mexican women in the United States. The World Health Organization (WHO) global data bank uses regional and national surveys to provide information on infant feeding practices and breastfeeding rates. The U.S. national exclusive breastfeeding (EBF) rate for infants under 3 months is 35%, while in Mexico a lower rate of EBF of 26 % is reported for infants less than 4 months of age (CDC NIS 2010, WHO IYCF, 2009). Exclusive breastfeeding rates for infants under 4 months of age in Mexico's urban areas is 21%, lower than the rural areas rate of 38% (WHO IYCF, 2009). Urban and rural communities are distinct in their employment opportunities and breastfeeding support services and these differences can influence breastfeeding practices. Breastfeeding behaviors are different among Hispanic subgroups in the U.S. and may reflect the emphasis placed on breastfeeding in the country of origin.

Breast Feeding Practices in Mexico

A description of infant feeding practices in Mexico will provide an understanding of the country of origin influences on feeding practices of Mexican immigrant women in the U.S. Cultural values and beliefs regarding infant feeding practices in periurban Mexico City were explored using a rapid ethnographic assessment of breastfeeding practices to provide information for a breastfeeding promotional campaign (Guerrero et al., 1999). Guerrero and colleagues used epidemiological and ethnographic interview techniques to gain a better understanding of maternal attitudes and behaviors, as well as psychosocial and health factors that were involved in mothers discontinuing exclusive breastfeeding. A 33 item standardized questionnaire was developed for the survey and interviews were completed face to face during household visits. A mother was eligible for the study if her youngest child was less than five years of age and a total of 150 mothers were randomly selected to participate. None of the mothers reported any formal employment. Mothers were asked to place in rank order of importance to her experience; the reasons to feed a child breast milk or formula, perceived infant health status and infant feeding choice and sources of infant feeding advice. Cultural consensus methodology was used to analysis these series of rank order responses. Mother's reported that the child's nutritional needs, health, growth, and hygiene were main reasons in deciding the type of infant feeding, with 91% choosing to breastfeed and only 2% reporting EBF up to 4 months. The most common feeding method was breast and bottle feeding, providing formula, water or tea during the first day postpartum and early introduction of solids to the infant was three months of age. Physicians were ranked as the most important source of advice and stopping or reducing breastfeeding (68%), or when mothers reported folk illness such as Coraje (anger) (52%), Susto (fear) (54%), not enough milk (62%) or bad milk related to an illness of the mother (56%) or the child (43%)

(Guerrero et al., 1999). Women reported cultural beliefs and reasons for stopping or reducing breastfeeding such as feeling emotions such as anger or fear, and to prevent transferring these emotions in the breast milk and potentially harming the infant they would not breastfeed. Increasing the use of supplementary foods during many common childhood illnesses and conditions was a common practice and breastfeeding was reduced or stopped. An understanding of cultural beliefs that influence breastfeeding practices should be included in breastfeeding promotion interventions. Data obtained from this ethnographic study was used to guide a peer counselor intervention to promote exclusive breastfeeding.

In Mexico, infant and young child feeding practices (IYCFP) were examined and a comparison between two nationally representative samples, the Health and Nutrition Survey of 2006 and the National Nutrition Survey in 1999 was completed to provide current practices and to support public health national programs (Gonzalez de Cossio, Escobar-Zaragoza, Gonzalez-Castell, Reyes-Vasquez & Rivera-Dommarco, 2013). Overall, breastfeeding practices in 2006 remained stable and a trend of lower rates than in 1999 was identified but did not reach statistical significance. However, there was a significant decrease in exclusive breastfeeding for the Indigenous populations, from 46 % in 1999 to 34.5% in 2006 (Gonzalez de Cossio, et al., 2013). Breastfeeding benefits are greatest among vulnerable populations such as those who live in poor communities and where access to water and sanitation conditions are worse, making the decrease in EBF practices among the Indigenous populations of high importance (Chapman, Morel, Anderson, Damio, Perez-Escamilla, 2010). Positive trends were identified with duration of any breastfeeding increasing from 9.7 to 10.4 months, and breastfeeding indicators improved for groups of upper socioeconomic levels, somewhat older women and better educated women (Gonzalez de Cossio, et al., 2013). Complementary feeding from 6 to 8 months improved but the

timing did not comply with the WHO recommendations. Both early and late introduction of foods was identified, 25% of all children receiving formula or other non-breast milk substance around birth. Daycare centers used by federal workers provided by the national health programs promote the early introduction of solids at four months, thus modeling inappropriate feeding recommendations. Children of Indigenous and rural families from lower socioeconomic levels were found to have late introduction of solids placing them at risk for poor growth (Gonzalez de Cossio, et al., 2013). The use of BFHI initiatives in maternity care practices and effective and culturally tailored marketing techniques are recommended as opportunities to improve infant feeding practices in Mexico. Examples of countries as that have implemented infant feeding programs and have succeeded in increasing exclusive breastfeeding include Brazil, Colombia, Haiti and Peru (Lutter, Chaparro, Grummer-Strawn & Victora, 2010). Mexico has great need and potential to improve its infant feeding practices.

Breastfeeding Practices of Mexican Women in the U.S.

Bunik and colleagues explored barriers to breastfeeding and reasons for mixed feeding of breast and formula or "Las Dos" in a predominately Mexican community living in Denver, Colorado (2006). The study design used key informants to develop focus group questions and sampling, then eight focus groups were held with breast and bottle feeding families, and a total of 29 interviews were completed with mothers who had chosen to formula only or mixed feeding. Focus group and interview transcripts were content coded and analyzed. The authors identified four main themes, with the first being that mothers want to breastfeed but also want to give their babies the "best of both", assuring the infant receives the healthy aspects of maternal milk as well as the vitamins in the formula (Bunik et al., 2006). Mothers mentioned receiving mixed messages from healthcare providers and WIC supplement and formula bags. The second

theme identified was that breastfeeding can be a struggle with pain, modesty, diet restrictions and breast changes identified by the women. The third theme was that breastfeeding was not in mother's control, even if she wants to breastfeed, things can occur that are beyond her control. The authors identified fatalism, in relation to how the women approached breastfeeding problems as women did not seek out assistance for problems with milk supply or latch (Bunik et al., 2006). The fourth theme identified was the influence of family and cultural beliefs. Some examples provided included avoiding negative emotions and supplementing with formula if the infant cried or was not chubby. Mothers also reported having to stay inside and follow special diets during the 40 days postpartum recovery period (La Cuarentena) or else they could risk not making enough milk. The authors report that the health benefits of colostrum and breastfeeding are clearly understood by the families interviewed but formula feeding is seen as an easy alternative to resolve a breastfeeding problem (Bunik et al. 2006). The authors recommend that breastfeeding support to Hispanic populations should include that breastfeeding can be a struggle but is worth the effort, dispelling the myth of the "best of both", increasing access to breastfeeding support services as solutions to potential problems, education regarding pumping or hand expression for those returning to work and encouraging the family to support the breastfeeding mother (Bunik et al., 2006).

Hispanic Ethnicity and Heterogeneity

Hispanics are the largest growing minority group in the U.S. and it is projected that by the year 2050 Hispanics will make up 25% of the United States population (Census Bureau, 2001). According to the Census Bureau the Hispanic population in the U.S. is composed of 66.1% Mexican origin, 14.5% Central or South American, 9% Puerto Rican, 4% Cuban and the remaining 6.4% are of other Hispanic origin (such as Dominicans or Spaniards) (Census Bureau,

2001). In addition, there exists a distinct demographic makeup of the Hispanic population in the U.S. with Mexican ethnicity primarily located in the west and south, Puerto Rican's clustered in the north east and Cubans primarily in the south, and finally Central and South Americans located in the northeast, south and west. The Hispanic community in the United States is diverse and heterogeneous with cultural variations within and among ethnic groups. Hispanics are reported to have a mean age of 27.6 years making them younger than the general population as a whole at 36.6 years (Hispanics, 2011). Birth rates (per 1000 of the total population) vary among Hispanics in the U.S. with the highest among those from Mexico at 25.0, then Puerto Rico at 18.1 and Cuba at 9.3 (Sutton, 2005). Infant mortality rates (per 1000 live births) are higher for those of Puerto Rican origin (8.3) than among those from Mexican origin (5.5), and the lowest rate is found from Cuban origin (4.42) (MacDorman,2008). Both Mexican and Puerto Rican Hispanics share the burden of high rates of type 2 diabetes with rates of 11.9% and 12.6%, respectively, compared to 6.6% of non-Hispanic whites (American Diabetic Association, 2005). Hispanic ethnic groups also vary in health status and health service needs. The State of Florida presents a unique opportunity as there is a diverse Hispanic population present. Currently the top three countries of origins for Hispanics in the state of Florida are Mexico, Cuba and Puerto Rico.

Acculturation

The concept of acculturation was introduced at the Social Science Research Council in the mid 1930's (Redfield, Linton & Herskovitis, 1936), and today is described as "the process by which individual or group cognitions and behaviors change as a result of contact with other cultural groups" (Berry, 1977). Originally acculturation was thought of as a one-dimensional process only moving from minority to dominant culture. Berry's definition of acculturation will be used to guide this research study, the process by which individual or group cognitions and

behaviors change as a result of contact with other cultural groups (Berry, 1997). Berry's acculturation model (Figure 2, Berry 1997:15) explains the acculturation process at group and individual levels as well as the role of society of origin, group acculturation, society of settlement, moderating factors prior to acculturation and moderating factors during acculturation, while addressing the experience, coping, stress and adaptation. This framework is useful in describing in more detail the Mexican country of origin and breastfeeding practices.

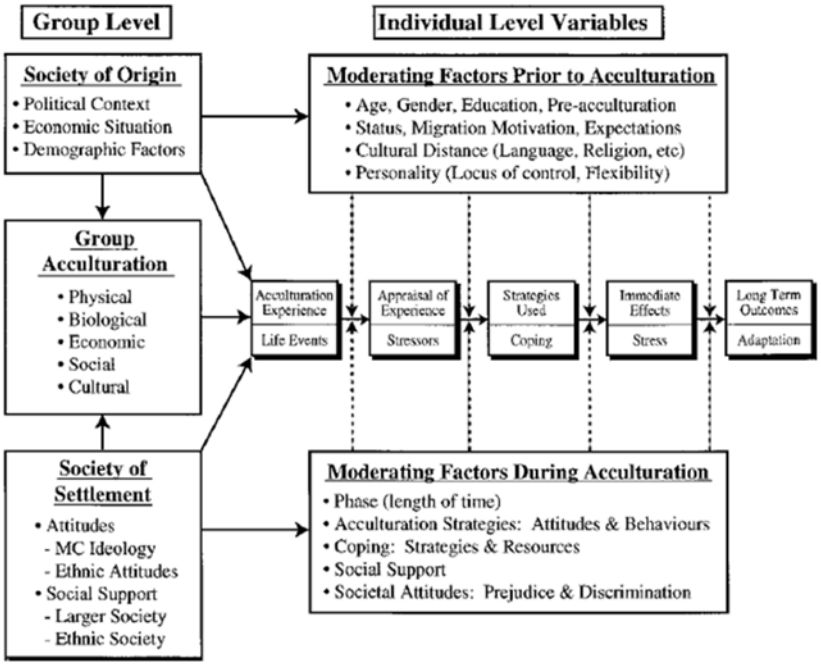


Figure 2: Berry's Acculturation Framework (adapted from Berry, 1997, p 15).

To fully study acculturation it would be important to examine two locations, origin and that of settlement. We need to understand the society of origin and experience to describe "where the person is coming from" (Berry, 1997:16). This allows for estimation of cultural distance, how different is society of origin from society of settlement (Berry, 1997). Knowledge of the location of settlement needs to be addressed, how receptive people are to diversity, how well groups are accepted as this affects the extent of discrimination and rejection and can have negative outcomes for adaption. Group acculturation refers to change that occurs as result of cultural

influences of various levels. Examples provided include moving from urban to rural, new diets, loss of status or reduced employment opportunities or learning a new language. Moderating factors prior to acculturation may include health, age, motivation, cultural distance (how different settlement society is from origin) and individual personality.

Moderating factors during the acculturation process can include time in the U.S., acculturation strategies, attitudes and behaviors, social support and prejudice and discrimination. It is during these two time points, that moderating factors can produce variations in the process of psychological acculturation. The first is the experience of the acculturation process and the meaning or appraisal of that experience. This time can be identified as the adjustment period and involves cultural shedding, cultural learning and cultural conflict. High levels of conflict can lead to acculturative stress. Strategies and coping mechanisms can reduce the effects of stress and this can directly impact long term adaptation.

Berry points to two issues that all plural societies, groups or members will have to deal with on "how to acculturate," cultural maintenance and contact and participation (Berry 2003). An acculturation framework that deals with the two issues described above is proposed to have four strategies, Separation, Assimilation, Integration and Marginalization (Berry, 2003). Assimilation strategy is defined as not maintaining own cultural identity and seeking interaction with other cultures. Separation is the opposite and can be defined as when a person holds onto their original culture and at the same time does not want to interact with others. Integration can be defined when there is an interest in sustaining both cultures and cultural identity is maintained as well as involvement with the larger social network. Marginalization is defined a not wanting to sustain own cultural identity and not wanting to interact with others. Integration is further described as

requiring mutual accommodation to be successful, it has to be freely chosen and in a society that endorses and accepts cultural diversity (Berry, 2003).

The concept of integration as introduced by Berry (1980) has been defined as that of sustaining both heritage and receiving cultures and has mainly been expressed as cultural practices (Berry, Phinney, Sam & Vedder, 2006). A person who is bicultural has some competence in more than one culture at a time. Adherence to both the culture of origin and dominant culture is a fluid process that may not be equal and is dependent on the individual. Developing bicultural competence or bicultural efficacy involves acquiring knowledge of both cultures (LaFromboise, Coleman & Gerton, 1993).

Recently Schwartz et al (2010), presented multidimensional biculturalism, a more expanded view of biculturalism, to include values, practices and identifications that may vary depending on the context or situation, such as work or home setting. Two forms of biculturalism are described. The first is an individual who may choose to "keep separate their heritage and cultural streams" because they perceive this may cause conflict (Chen et al., 2008), while the second chooses to "synthesize their heritage" and incorporate aspects of both and creating unique blends (Benet-Martinez & Haritatos, 2005). Positive outcomes have been reported for individuals identified as "blended bicultural," higher self-esteem and lower psychological distress when compared to those who choose to keep separate their heritage and cultural streams (Chen et al., 2008). Schwartz and colleagues inquire if the blended bicultural type can facilitate improved health outcomes.

Addressing the impact of culture on health requires the use of consideration of the range of cultural, social, economic and political conditions of importance to the identified group (Hunt, Schneider & Comer, 2004). For example, if a claim is made about the effect of the Hispanic

culture, there should also be measurement of that specific feature (Hunt et al., 2004). Methodological rigor in acculturation research is needed to elucidate a complete understanding of the effect of acculturation. Critiques of acculturation research include use of language preference as the number one component of acculturation measures, combining immigrant and foreign born subjects in analysis, failing to inquire if the behavior studied is prevalent in the country of origin and not controlling for the impact of socioeconomic and education related factors that are known to affect the specific behavior of interest (Hunt et al., 2004). Given the reasons above, it is not surprising to see mixed results in acculturation research. Hunt and colleagues conducted a critique of systematic reviews of acculturation research with Hispanics and found that 61 % of studies found low acculturation to be associated with a positive health outcome while 42% found low acculturation to be associated with a negative health outcome (Hunt et al., 2004). They advise that acculturation research needs to include specific cultural components that are being investigated, within their context in regards to Hispanic ethnicity (Hunt et al., 2004). Acculturation research has been highly critiqued due to its inconsistent results, lack of addressing SES and lack of "clear" definition. Some have recommended that research that is focused on acculturation be stopped until a more clear understanding is identified (Hunt et al, 2004). These critical and strong remarks should help to push acculturation research into a new paradigm, with use of recommendations as along with collection of qualitative data to provide a more complete understanding of this complex concept.

Using the bidimensional model of acculturation allows measurement of maintenance of cultural elements from the country of origin as well as adherence to the current dominant culture, thus allowing an individual two pieces of "cultural luggage" at the same time (Cabassa, 2003). Reliance on proxy variables such as place of birth, place of education, number of years in U.S.

and language use, assume that acculturation can be inferred from the amount of exposure to the dominant culture (Cabassa, 2003). Imposing that an individual conform to the dominant culture does not allow for the measurement of their maintenance of the native culture. The consideration of the role of acculturation as both a protective factor and a risk factor is imperative to gain a greater understanding of its role in health of immigrant populations (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006). Viewing acculturation as multidimensional allows for consideration of not only how an individual or group in a dominant society changes but also what they choose to retain of their culture and also how the dominant culture changes itself.

In conclusion, there is a need to move beyond the single proxy measures of acculturation which can lead to fragmented and conflicting findings of how acculturation affects individuals (Cabassa, 2003). Improvement in the operationalization of acculturation indicators is needed as well as the inclusion of measurement of cultural values and attitudes and how they relate to acculturation measures and health outcomes.

Hispanic Health

Research with Hispanic/Latino populations has found that high levels of acculturation to American culture have been linked to higher rates of infant mortality, cancer and poor physical and mental health. Low levels of acculturation have been found to be protective against low birth weight among foreign born, Mexican American mothers (Flores & Brotanek, 2005). These rates vary among the different Hispanic ethnicities. In an attempt to recognize why lower acculturation is associated with better outcomes, the Healthy Migrant Hypothesis has been proposed and implies that the healthiest members of a population are more likely to migrate (Flores & Brotanek, 2005). Rates of risky health behaviors and patterns of chronic diseases such as smoking and overweight/obesity have been found to increase with higher levels of acculturation.

Hispanics have had the largest increases in obesity rates and Hispanic women have had four to five fold increases in Class III obesity (BMI >40) between the years 1990 and 2000 (Freedman, 2002). If the Healthy Migrant Hypothesis is true, then why do some health outcomes worsen with greater degree of acculturation and length of stay in U.S. and why has this not been documented in other Hispanic ethnicities other than for those from Mexican ethnicity? This hypothesis does not provide an explanation for the entire spectrum of health outcomes that have been studied in regards to acculturation (Flores & Brotanek, 2005).

Horevitz and Organista (2013) provide a historical analysis of major U.S. Latino groups providing further explanation as to why some Latino groups have health disparities even when sharing common values and practices in relation to degree of acculturative stress and adjustment at the population level. A comparison of the three countries, Cuba, Mexico and Puerto Rico was reviewed. Levels of SES and health indicators indicate that Puerto Ricans have the worse SES and health indicators, while Mexican Americans can be placed in the mid-range and Cuban Americans have the best health outcomes. These differences may be attributed to variances in acculturation and degree of acculturative stress and levels of adjustment (Horevitz & Organista, 2013). These differences in acculturation and degree of acculturative stress and adjustment are presented as an explanation for the lack of a health paradox for Latinos from Cuba or Puerto Rico as compared to Mexicans in the U.S. Mexico's government is a federal republic and its immigrants to the U.S. are not provided refugee status, thus not benefiting from services or a legal pathway to residency. Many recent immigrants from Mexico find themselves in the U.S. with illegal status and working harsh jobs, a situation that continues as immigration reform is an ongoing political debate. The degree of acculturative stress for the country of Mexico is medium.

The predominant form of adaptation is segregation and integration with a medium level of adjustment (Horevitz & Organista, 2013).

In a qualitative study of Mexican American women's pregnancy experiences in a U.S. city on the Mexican border, selective biculturalism was identified as a protective behavior for stress reduction and health promotion (Lagana, 2003). The author provides an example of selective biculturalism as returning to traditional pregnancy beliefs and practices regardless of level of acculturation. Traditional pregnancy beliefs identified included eating well (come bien), walking (caminar) and don't worry (no se preocupe). A low fat diet, high in protein, low in processed foods and adequate pregnancy weight gain were included in eating right. The traditional concept of walking was promoted to prevent the fetus from sticking to the inside of the uterus and as a measure to avoid a complicated delivery. Traditional beliefs promote reducing stress as a health behavior to avoid any detrimental effect on the pregnancy. Prenatal care incorporated medical visits in addition to eating right, stopping harmful habits such as smoking and reducing the stress load from work (Lagana, 2003). In addition, the practice of La Cuarantena, (40 days postpartum) is followed, in which the mother is relieved from her domestic duties allowing her to focus on recovering and caring for the newborn promotes health (Lagana, 2003). La Cuarantena (40 days postpartum) can be considered a time period in which the mother can be encouraged to focus on exclusively breastfeeding her newborn and establishing a sufficient milk supply (Moreland, Lloyd, Braun, & Heins, 2000). Traditionally the maternal grandmother assisted the new mother. The grandmother may need to travel to the U.S, which may require a visa and be a financial burden on the family of immigrants. Hispanic women who utilize selective biculturalism can help to retain Hispanic cultural attributes that are beneficial for the promotion of exclusive breastfeeding.

Breastfeeding and Acculturation

While acculturation and breastfeeding behavior have been identified as being inversely related, further explanations of the factors responsible for this association have not been demonstrated. Rassin and colleagues (1993) conducted a preliminary investigation of the association between acculturation and the initiation of breastfeeding in a predominately Mexican population. Acculturation was measured using a unidimensional, investigator developed, 20 items questionnaire that was based on acculturation scales by Cuellar et al. and Burnam et al (Rassin et al., 1993). Acculturation was divided into low, medium and high. The highest rate of breastfeeding initiation was found to occur in the least acculturated group. Rassin and colleagues (1994) further investigated the association between acculturation and the initiation of breastfeeding utilizing a larger population (N=840) of mothers in a U.S. town on the Mexican border town. Acculturation was measured using a 14 item, investigator developed acculturation tool that measured language, heritage and associations. Acculturation was strongly related to the intent to and initiation of breastfeeding. An inhibiting effect of acculturation was found as the highest initiation of breastfeeding was found among women least acculturated and lowest among those most acculturated (Rassin, et al., 1994).

Byrd and colleagues used acculturation indicators to predict breastfeeding history and intentions among Mexican American mothers in a U.S. city on the Mexican border city (Bryd, Balacazar & Hummer, 2005). Acculturation was measured using language spoken at home, language ability, country of birth, and country in which education was received. The study was cross-sectional and mothers were interviewed postpartum in the hospital. Previous breastfeeding experience was found to be significantly associated with educational attainment, speaking both English and Spanish at home, having had prenatal care with the previous pregnancy and with

both country variables (Byrd, Balacazar & Hummer, 2005). In addition, multiparous women who had been born in Mexico and first time mothers who finished school in Mexico were more likely to intend to breastfeed. The authors concluded that acculturation was associated with breastfeeding history and intention to breastfeed. They recommended that methods that rely on language preference as an indication of acculturation may not be useful at the U.S. Mexico border.

Thiel de Bocanegra studied the influence of social support and acculturation on breastfeeding practices of 962 foreign born or Puerto Rican born women in New York City (Thiel de Bocanegra, 1998). An investigator-developed tool was used to measure acculturation using 8 questions consisting of language preference, proficiency in English, language use and social interaction and life style choices. These questions were adapted from two acculturation scales developed for Hispanic Americans and one used for Asian Americans. Length of stay in the U.S. and language in which the questions were completed were used to validate the acculturation tool. Perceived infant feeding norm and why the mother used infant formula were also documented. Education, age, tobacco use, country of birth, parity, perceived U.S. norm, medical problems and baby's birth weight were controlled for in analysis. More acculturated women were 2 times less likely to decide to breastfeed than less acculturated women. This negative effect was diminished when controlling for support by friends and family members and tobacco use in regression analysis (Thiel de Bocanegra, 1998). Variables found to predict breastfeeding were intent to breastfeed, being a nonsmoker and having a breastfeeding role model. A negative response to the item "A modern woman breastfeeds her baby" was also found to be negatively associated with breastfeeding intent. Acculturation was not found to influence breastfeeding in this sample.

A secondary analysis of the National Health and Nutrition Examination Survey (NHANES) 1999-2000 was done to provide an estimate of ethnic and acculturation differences in breastfeeding practices in the U.S. (Gibson, Diaz, Mainous & Geesey, 2005). Acculturation status was measured using the Short Acculturation Scale (SAS), a unidimensional language based measure. Women were classified as having either a low or high acculturation levels. A higher prevalence of breastfeeding was found among low acculturated Hispanic women compared to high acculturated Hispanic women and White women. Hispanic women with low levels of acculturation were more likely to cite their child's physical/medical condition as a reason not to breastfeed while Hispanic women with high levels of acculturation cited child's preference of the bottle (Gibson et al., 2005). Even after controlling for education, age and income, higher acculturated women were less likely to breastfeed their children than low acculturated women. This study did not define the variable Hispanic by country of origin or Hispanic subgroup.

Harley and colleagues utilized a prospective birth cohort of low income mothers of Mexican descent in California to determine whether increased years of residence in the U.S. was associated with poorer breastfeeding practices (Harley, Stamm & Eskenazi, 2007). Exclusive breastfeeding and any breastfeeding were the breastfeeding practices measured. The authors collected various acculturation variables and due to little variability in findings decided on years in the U.S. as a proxy for acculturation. Investigators found that life time residents in the U.S. were 2.4 times more likely to stop exclusive breastfeeding than immigrants who had lived in U.S. for 5 years or less after controlling for age, education, marital and work status (Harley et al., 2007).

Kimbro and colleagues investigated the influence of acculturation on initiation and duration of breastfeeding among Mexican-Americans utilizing data from the Fragile Families and Child Wellbeing Study (Kimbro, Lynch & McLanahan, 2008). Initial interviews were conducted within 48 hours of birth for mothers and a short time after for fathers while breastfeeding duration information was collected at the one year interviews. Acculturation was measured using measures of preferred language, attitudes about gender role, religiosity, and cultural engagement (Kimbro et al., 2008). In the study socioeconomic level and family structure were obtained as well as factors known to impact breastfeeding. Low levels of acculturation were found to be protective for breastfeeding. Mexican immigrants, who choose to breastfeed and breastfeeding for longer, provide their children with health advantages. These health advantages may then form a basis for the Hispanic Paradox, where good health outcomes are seen in immigrants despite their low socioeconomic status and other risk factors. The author presents the increased breastfeeding practices of Mexican immigrants as an example of the Hispanic paradox of better health outcomes. A need exists for more research to provide a better understanding of the cultural transmission of health behaviors and why they deteriorate over time in the U.S. (Kimbro et al., 2008).

Sussner and colleagues investigated the influence of acculturation on the initiation and duration of breastfeeding among a sample of low income Latina women in the north east U.S. (Sussner, Lindsay & Peterson, 2007). The study was a secondary analysis of data collected in a randomized controlled trial of a nutrition and physical educational program. All women were income eligible to receive WIC and had infants that were less than 20 weeks old at enrollment. Acculturation was measured as mother's nativity, mother's parents' nativity, years of U.S. residence and a measure of language preference adapted from Marin's acculturation scale.

Nativity was defined as place of birth. The authors indicate that the Latina sample was representative of various regions and countries including Central and South America, the Dominican Republic and Puerto Rico, yet country of origin information was not collected. The authors recognized the need to include Latinas from a range of diverse backgrounds to provide a "broad analysis of acculturation" (Sussner et al., 2007). Final multivariate models found mothers, who exclusively used their native language at home, were more likely to initiate and have a longer duration of breastfeeding compared to mothers who did not exclusively use their native language at home. Years of U.S. residence and mother's nativity were not significantly associated with initiation or duration of breastfeeding in the final model. A significant predictor of breastfeeding duration was the mother's parents' nativity, a unique finding. The authors suggest that this finding may represent the importance of exploring the cultural practices taught by family members born outside the U.S. and how this can influence immigrant families living in the U.S. (Sussner et al., 2007). .

An association between acculturation and breastfeeding initiation was not found among a sample in which the majority of women were Puerto Rican (Anderson et al., 2004). What was found to be important in predicting ever breastfeeding duration was social support as reflected in social capital. The authors recommended providing support or assistance in the decision to breastfeed for Hispanic mothers (Anderson et al., 2004). Utilizing a predominately Puerto Rican population, Anderson and colleagues conducted a randomized controlled trial to assess the impact of peer counseling on exclusive breastfeeding rates among low income inner city women (Anderson, Damio, Chapman & Perez-Escamilla, 2007). Non-Puerto Rican Hispanic women were found to be six times more likely to exclusively breastfeeding (EBF) at two months compared to Puerto Rican women. When compared to the control group, Puerto Ricans were 10

times more likely and the Non-Puerto Rican Hispanics were 66 times more likely to EBF at two months (Anderson et al., 2007). A negative association was found between EBF and U.S. residence of the infant's maternal grandmother. The negative association between EBF and the U.S. residence of the infant's maternal grandmother was postulated as serving as a proxy for acculturation by the authors. The residence of a maternal grandmother in the U.S. is more likely to be a proxy if the woman has resided in the U.S. longer and thus may be more acculturated. In addition, the authors suggested that maternal grandmothers may not have been generally supportive of breastfeeding since they may not have been comfortable themselves with breastfeeding and thus may have felt more at ease with bottle feeding.

Gorman and colleagues (2007) examined early postpartum breastfeeding practices and acculturation status using medical record data of women from the San Diego Birth cohort study during the time period 1994-1996. Proxy measures of acculturation were used that consisted of language spoken and race or ethnicity, resulting in either low or high acculturation for women of Hispanic ethnicity and White ethnicity. The sample consisted of low risk women with 66% born in Mexico, 31% in the U.S. and 3% as other. In this study women in the low acculturation group were found to be more likely to breastfeed exclusively at discharge than those in the high acculturation group (OR 1.36, CI 95%) and women in the White group were found to have greater odds of exclusive breastfeeding when compared to those in the high acculturation group (OR 1.49, CI 95%), while adjusting for confounding variables (Gorman, Madlensky, Jackson, Ganiats, & Boies, 2007). The rate of exclusive breastfeeding was high for this sample overall with rates at 79.7%, 76.1% and 68.6% for the White Non-Hispanic , low acculturation and the high acculturation groups, respectively. The authors suggest that as Hispanic woman become more acculturated expectations of breastfeeding behaviors may change and they ask for future

research to focus on the importance of exploring specific cultural influences and their effect on breastfeeding behavior.

Recently, Chapman & Perez-Escamilla (2013) have assessed the relationship between acculturation and breastfeeding using a multidimensional scale. Data used for the study was obtained from a randomized trial of a specialized breastfeeding peer counseling intervention promoting exclusive breastfeeding that targeted overweight and obese low income women, n=114. The Acculturation Rating Scale for Mexican Americans II, (ARSMA II) was modified and a 10 item format created with reduced response ranges from 1-5 to 1-4. The ARSMA II was completed over the phone during the last trimester of the pregnancy and breastfeeding practices were measured up to six months postpartum with a monthly phone call. Acculturation was assessed using a linear score (LAS) and categorized into three groups, More Hispanic (LAS > 0.5 SD below the mean), Bicultural (LAS ± 0.5 SD) , More Americanized (LAS > 0.5 SD above the mean) as well as four orthogonal classifications, Integrated High, Traditional Hispanic, Integrated Low and Assimilated. Breastfeeding initiation was high for the sample overall at 98%. Using the LAS linear score those who scored as more Hispanic were significantly less likely to stop breastfeeding compared to those who were more American, but when adjusted for age only maternal age was found to be positively associated with breastfeeding duration. Median duration of breastfeeding was 2.1 months, and those who were still breastfeeding at two months were found to be significantly older and had lived in the U.S. less time than those who were not breastfeeding. No significant differences between those breastfeeding at two months were found for maternal education, delivery mode, Women, Infants and Children (WIC) participation, employment or maternal breastfeeding status as an infant. Breastfeeding continuation rates were found to vary significantly between acculturative types with the Integrated low group more likely

to continue to breastfeed then the Traditional Hispanic or Assimilated and Integrated high groups ($p< 0.05$, $p <0.05$, $p <.001$). The Integrated low group was more likely to continue breastfeeding then the Integrated high group but this finding did not reach significance ($p = 0.06$). The authors conclude that further qualitative research is needed to explain the differences in breastfeeding continuation rates for the acculturative types identified. They recommend the use of the multidimensional versus linear assessments, and have been the first to provide an example with a modified 10 items (ARSMA II) and breastfeeding outcomes (Chapman & Perez-Escamilla, 2013).

A higher initiation and duration of breastfeeding has been documented for foreign born mothers compared to their U.S. counterparts (Bonuck, Freeman, & Trombley, 2005; Gibson-Davis & Brooks-Gunn, 2006). The role of acculturation and related factors in the breastfeeding practices of Hispanic women need more detailed description. Suggestions to protect and strengthen the traditional health behaviors of immigrant women through nursing interventions are needed. Consideration of the role of acculturation as both a protective and a risk factor is imperative to gain a greater understanding of its role in health of immigrant populations (Abraido-Lanza et al., 2006).

Overall, research on acculturation into American culture and breastfeeding practices has focused on Mexican and Mexican-American mothers, finding those with low levels of acculturation to American culture to be more likely to initiate breastfeeding successfully (Beck, 2006). The three countries of origin, Cuba, Mexico and Puerto Rico are distinct in various aspects such as breastfeeding prevalence and political climate in the country of origin as well as differing U.S. immigration policies and this was the basis for the initial recruitment strategy for this study (Portillo et al., 2001; Petrova et all., 2007).

Self-Efficacy

Central to social cognitive theory (SCT) is perceived self-efficacy, a person's belief about his capabilities to perform a specific task or behavior (Bandura, 1977). Self-efficacy is acquired from four principle sources: performance accomplishments, vicarious experiences, verbal persuasion and physiological states (Bandura, 1977). Performance accomplishment is based on personal mastery and is increased with success and decreased with failure. Vicarious experiences include seeing others perform tasks and modeling. Verbal persuasion includes receiving advice and suggestions and can either be a positive or negative influence. Physiological and affective states such as high level of emotional arousal or negative moods can affect the perception of self-efficacy. Perceived self-efficacy is related to subsequent behavioral change and thus is of high importance in clinical practice concerned with behavioral change. General self-efficacy as a construct has been validated as one-dimensional and global construct using participants from 25 different countries, which included three Latino countries (Spain, Costa Rica, Peru) (Scholz et al., 2002).

Breastfeeding Self-Efficacy

Breastfeeding self-efficacy is a mother's confidence in her ability to successfully breastfeed her infant (Dennis, 1999). Increasing maternal breastfeeding self-efficacy has been associated with an increase in duration and exclusivity of breastfeeding (Noel-Weiss et al., 2006; Dennis & Faux, 1999). Breastfeeding is one of the most immediate decisions parents make upon the birth of the child and is one that has the potential for immediate and long term health implications for both mother and child. This is the reason for selecting breastfeeding as the parental behavior to be studied in this initial study. Focusing on parental self-efficacy provides a solid base upon

which to build future studies of parental behaviors such as timing and early introduction of solid foods.

Parental Self-efficacy

Parental self-efficacy is the confidence a new mother has in her ability to meet the demands and responsibilities of parenthood (Reece, 1992). A mother's past experiences in caring for infants, observations of other mothers, encouragement from others and the responses received from the infant and family, all contribute to a new mother's parental self-efficacy (Reece, 1992). Thus parental self-efficacy can be related to actual parental behaviors. Issues such as the value placed on motherhood and parenting practices may differ for mothers of diverse backgrounds. What is germane to American parenting practices may not be so for other countries. Maternal dedication to current breastfeeding or formula feeding practices in the U.S. is a prime example of differing values placed on parenting practices. A significant positive correlation was found between parental self-efficacy as measured by the Parent Expectation's Survey (PES) and perceived insufficient milk score on the Perceived Insufficient Milk Questionnaire (PIM) ($r = .49$, $p < .01$) in a sample of mothers with infants ages 1-11 weeks (McCarter-Spaudling & Kearney, 2001). Perceived insufficient milk supply occurs when a mother believes that she does not have enough milk to meet her infant's need. Perceived insufficient milk can be become actual insufficient milk if the mother then supplements the infant thereby decreasing her milk supply. Parental self-efficacy was a stronger predictor of perceived breast milk supply than was maternal age, education or parity. Using multiple regression analysis, parenting self-efficacy explained 23% of the variance in perceived insufficient milk (McCarter-Spaudling & Kearney, 2001). Identification of early predictors of parenting self-efficacy were investigated in a prospective cohort design of a (n =175) predominately white sample of women in Canada. The

cohorts were divided by positive and negative perceptions of childbirth. Parenting self-efficacy was measured with the PES. Greater parenting self-efficacy during the early postpartum period (12- 48 hours) was found for multiparty, and single marital status, which correlated with a positive perception of the birth and higher general self-efficacy and excellent partner relationship (Bryanton, Gagnon, Hatem & Johnston, 2008). At one month in this sample greater parental self-efficacy was predicted by age (<30), multiparty and correlated with excellent partner relationship and maternal perception of infant contentment.

Warren and McCarthy (2011) completed an integrative review of maternal parental self – efficacy in the postpartum period, 8 studies met criteria for inclusion. Findings included a statistically significant increase in maternal parental self-efficacy over time from baseline and a positive relationship with number of children, social support and maternal parenting satisfaction. On the other hand, a negative relationship between maternal parental self-efficacy was found for maternal stress, anxiety and postpartum depression. A variety of instruments exist and the majority have utilized Bandura's theoretical framework (Warren & McCarthy, 2011). In addition, the samples consisted mostly of Caucasian women with higher levels of education. Parenting self-efficacy was studied among Mexican American adolescents and their parents and was found to predict future positive control practices and had a direct effect with decreased adolescents conduct problems (Dumka, Gonzalez, Wheeler & Millsap, 2010). The authors present this study as an example of the cross- cultural utility of the SCT to parenting in Mexican American families. Parenting interventions designed to prevent adolescent conduct problems with Mexican American families should identify low levels of parental self-efficacy and work towards increasing levels (Dumka et al., 2010).

The inclusion of the measurement of the self-efficacy construct in health behavioral research is important for measuring personal change (Bandura, 2004). There is limited research on how self-efficacy and acculturation influence the health behaviors of Hispanic/Latino populations. Further exploration of self-efficacy in research on health behaviors and practices is of great importance in achieving behavioral change. English language use has been associated with improved self-efficacy and this is alarming given the varied levels of English proficiency among Hispanic/Latino ethnicities (Bernal, Woolley, Schensul & Dickinson, 2000). The construct of self-efficacy across cultures has been proposed as a mediator to increase breastfeeding initiation and duration (Schlickau & Wilson, 2005). Self-efficacy is a potentially modifiable variable that influences breastfeeding and its use among various cultural groups should be tested and used in designing interventions (McCarter-Spaulding & Gore, 2009). The current study describes the roles of self-efficacy and social support and their relationship with acculturation and breastfeeding practices in a sample of Hispanic women from Mexican origin.

Chapter Three: Methods

This chapter describes the methods used to examine the relationships among measures of acculturation, self-efficacy (general and parental), social support, age, socioeconomic status and breastfeeding outcomes among the sample of women from Mexican country of origin. A description of the sample selection and recruitment procedures and data analysis plan are provided.

Study Design

The design was a prospective, cross-sectional study focusing on breastfeeding behavior in a sample of Hispanic/Latina women from Mexico, their country of origin. A convenience sample of women who self-identified as Mexican Cuban or Puerto Rican was obtained at Tampa General Hospital (TGH). Initially the proposal was to recruit women from these three countries of origin. It was estimated that 100 women would be needed from each of the countries of origin for a total of 300 to allow for testing of the moderating effect of country of origin, using structural equation modeling. When testing models of moderate complexity sample sizes of at least 200 are recommended and use of sample sizes less than 200 may provide inaccurate parameter estimates (Marsh et al., 1988). The numbers of Cuban and Puerto Rican mothers were limited and did not allow the original proposal to be carried out.

Inclusion/Exclusion Criteria

Inclusion criteria consisted of self-identification with the Hispanic ethnicity of Mexican, Cuban or Puerto Rican country of origin, intention to breastfeed partially or exclusively, the ability to read and write in English or Spanish, being within the ages of 18-45 years and a singleton birth. Study exclusion criteria consist of maternal HIV infection, maternal use of contraindicated medications (AAP, 2001), infant diagnosis of galactosemia, infant born with major congenital defects, gestational age less than 37 weeks, Caesarean birth or neonatal intensive care unit admission of infant.

Study Setting

Tampa General Hospital (TGH) is a tertiary level hospital that is the primary teaching hospital for the University of South Florida. The hospital has approximately 5,000 births a year and an established lactation department with a breastfeeding initiation rate of 75%. The breastfeeding initiation rate among Hispanic women at TGH for the time period January 2008 to November 2008 has been approximately 85%. In 2006, 50.8% (N= 2800) of postpartum patients were Hispanic. Of these patients, 73.2% (N= 2065) gave birth vaginally. The study enrolled only women having vaginal births so as to avoid confounding influence from complications related to Caesarean births and their possible effects on woman's breastfeeding practices.

Procedures and Recruitment

Both the University of South Florida and the Tampa General Institutional Review Boards (IRB) approval were obtained prior to start of the study. The study involved no more than minimal risk for the mother infant dyad. Recruitment was done with distribution of flyers in the postpartum unit at Tampa General Hospital. This provided potential participants with study

information. Potential subjects were approached on the TGH postpartum floor and the study was described. If participants were interested then the prescreening sheet with self-identification of country of origin and breastfeeding intention was administrated. If subjects qualified by selecting countries of origin as Mexico and intention to breastfeed then informed consent was administered. Informed consent was obtained at TGH by either the PI or research assistant, both of whom were bilingual. Disclosure of legal or illegal status in the U.S. was not required for the study and was not documented. It was a requirement that the respondents be able to read English or Spanish to participate in the study. Flyers were posted in the nurse's lounge on the Mother Baby floor at TGH to inform staff of the study and an explanation of the study was provided to staff.

Measures

Index of Breastfeeding. Breastfeeding behavior was measured to determine intensity (exclusive, partial or token) of breastfeeding prior to discharge and at 6 weeks postpartum. This information was obtained from maternal self-report and will be used to determine the Index of Breastfeeding (Figure 2). The PI or the lactation consultants assessed the Index of Breastfeeding during the hospitalization. At six weeks postpartum a telephone call was made to obtain maternal report of the last 24 hours breastfeeding pattern using the Index of Breastfeeding as a guide (Figure 2). The Index of Breastfeeding records full breastfeeding, partial or token breastfeeding. Full breastfeeding has two categories with exclusive breastfeeding being "no other liquid or solid is given to the infant" and almost exclusive being "vitamins, water, juice or ritualistic feeds given infrequently in addition to breastfeeds" (Labbok & Krasovec, 1990). The definition of exclusive breastfeeding by the WHO has been updated to include only breast milk and the provision of vitamins, oral rehydration drops, and/or medications (WHO, 2008). Partial

breastfeeding consists of high (>80% of feeds are at breast or breast milk), medium (20-80% are at breast or breast milk) and low (< 20% of feeds are at breast or breast milk). Token is defined as "minimal, occasional, irregular breastfeeds", and in this analysis it included in the low breastfeeding category (Labbok & Krasovec, 1990).

Value	Breastfeeding Behavior	Intensity	Category
6	Exclusive	No other liquid or solid is given infant	Full
5	Almost Exclusive	water juice or ritualistic feeds given to infant in addition to breast milk (no formula)	
4	Partial High (Breast & Formula)	> 80% Feeds are breast milk	Partial
3	Partial Medium (Breast & Formula)	20-80% Feeds are breast milk	
2	Partial Low (Breast & Formula)	<20% Feeds are breast milk	
1	Token (Breast & Formula)	Minimal occasional irregular breastfeeds	Token
0	Not Breastfeeding at all Only Formula	None	Weaned

Figure 2: Index of Breastfeeding: Measurement of Intensity of Breastfeeding Behavior

Breastfeeding Duration. The duration of breastfeeding was documented at 6 weeks postpartum by a telephone call to assess the present Index of Breastfeeding. The time period of six weeks postpartum coincides with the return to work for many women. Employment has been identified as a barrier for the continuation of breastfeeding. If mothers had terminated breastfeeding, then the last date the infant received breast milk was documented as well as the reason for termination. The time period of six weeks was selected for the end measurement of breastfeeding intensity in an attempt to avoid this influence.

Bidimensional Acculturation Scale. The Bidimensional Acculturation Scale (BAS) allows for the examination of a person's affiliation with the Hispanic domain as well as the non-Hispanic domain (Marin & Gamba, 1996). The BAS consists of three language based subscales;

language use, linguistic proficiency and electronic media (Marin & Gamba, 1996). The scale consists of 12 items for the Hispanic and Non-Hispanic cultural domains. The Hispanic domain consists of items 4-6, 13-18 and 22-24. The Non-Hispanic domain includes items 1-3, 7-12 and 19-21. The averages of each of the cultural domains produce two scores with a score range from 1-4. Both scores should be utilized as a measure of an individual's level of acculturation. A cut off score of 2.5 can be used to distinguish low or high level of acculturation to each domain. Individuals scoring above 2.5 in both cultural domains are considered bicultural (Marin & Gamba, 1996). The BAS is available in English and Spanish and participants were able to choose the language selection of their preference. The BAS is unique in its ability to allow for a bidimensional approach to the measurement of acculturation capturing adaptation and retention of Hispanic and Non-Hispanic cultural domains. It does not measure linear acculturation. The BAS has been found to have high reliability and validity among Mexican- Americans and among Central Americans (Marin & Gamba, 1996). Peragallo and colleagues utilized the BAS among 657 low income Latina women from Mexican and Puerto Rican ethnicity and found high internal consistency ($\alpha = .90$) for the Hispanic domain and ($\alpha = .96$) for the Non-Hispanic domains (Peragallo et al., 2005).

Acculturation Rating Scale For Mexican Americans (ARSMA) II. The Acculturation Rating Scale for Mexican Americans II (ARSMA II) is a 30 item Likert scale with three major components, language, ethnic identity and ethnic interaction (Cuellar & Maldonado, 1995). The ARSMA II is an orthogonal scale that measures orientation toward Mexican and Anglo cultures using two subscales. The ARSMA II has been adapted for use with African Americans, various Asian Americans, all Latino Groups, and other ethnic groups. The Mexican Orientation Subscale (MOS) has 17 items and an alpha coefficient of .88. The Anglo Orientation Subscale (AOS) has

13 items and a coefficient alpha of .83. The ARSMA II has the capability of detecting both linear acculturation categories (Level 1-5) as well as orthogonal acculturation categories (Traditional, Low bicultural, High bicultural, and Assimilated). The mean of the AOS is subtracted from the mean of the MOS to produce the linear measure of acculturation with a positive score representing an Anglo orientation and a negative score for a Mexican orientation. The orthogonal indices that can be produced include Traditional, High Integrated Bicultural, Low Integrated Bicultural and Assimilated (Cuellar & Maldonado, 1995).

General Self-Efficacy Scale. General perceived self-efficacy was measured with the General Self-Efficacy Scale (GSE) (Schwarzer & Jerusalem, 1995). It has been utilized internationally and translated to 29 languages. The GSE is a 10 item survey with responses on a four point Likert scale with a range of scores 10-40. It is unidimensional and is estimated to require four minutes for completion. GSE tested samples from 23 nations produced Cronbach alpha coefficients ranging from .72-.90 with the majority in the 80's (Scholz, Gutierrez-Dona, & Schwarzer, 2002). Perceived self-efficacy is related to subsequent behavioral change and thus is of high importance in clinical practice concerned with behavioral change. Since the GSE is a general measure of perceived self-efficacy utilizing a scale designed to measure parental self-efficacy specifically will provide further valuable information.

Parent Expectation Survey. Parental Self-Efficacy was measured with the Parent Expectation Survey (PES) a 25 item self-report measure (Reece, 1992). The scale was designed to measure perceived self-efficacy in early parenting. It is a domain specific scale that was used with parents of infants aged 1-3 months and follows Bandura's self-efficacy conceptual framework. Each item starts with the stem "I can," and is followed by a specific behavior. The first phrase, for example, is "I can manage to feed my baby." Responses are: "cannot do,

moderately do, and certain can do." The Cronbach alpha coefficients were .91 at one month postpartum and .86 at 3months postpartum for a sample of 85 primiparous Caucasian women (McCarter-Spaulding, & Kearney, 2001). Construct validity was obtained with moderate correlations between the PES and what being the parent of a baby is like (WPL-R) self-evaluation subscale, r = .75, .64 ($p < .01$). The WPL-R measures self-reflection of early parenthood (Pridham & Chang, 1989). Thus self-efficacy as measured by the PES is conceptually similar yet different from that of self-evaluation as measured by the WPL-R. Predictive validity was demonstrated utilizing the postpartum self-evaluation questionnaire (PSQ) and maternal confidence subscale. Higher PES scores in early parenting were found to be associated with higher maternal confidence at 1 year postpartum (Reece & Harkless, 1998). In addition, PES scores at three months postpartum had a negative association with stress as measured by the Perceived Stress Scale (McCarter-Spaulding, & Kearney, 2001). Women with higher self-efficacy in early parenting were found to have higher levels of confidence and less stress one year after delivery in the sample studied. Using a sample of primiparous as well as multiparous mothers at three weeks postpartum, Cronbach's alpha of .90 on the PES (Reece & Harkless, 1998). In addition, higher mean PES scores were found for multiparas than primiparas demonstrating change in parenting self-efficacy over time as hypothesized by the self-efficacy conceptual framework. The scale has not been used with Hispanic women and so was translated into Spanish. Permission was obtained from the author for use in the study as well as translation. The back translation method was used and then the translated PES was tested with a sample of bilingual Hispanic women from Mexican, Cuban and Puerto Rican countries of origin. It was also reviewed by staff nurses from the respective countries of origin. English and Spanish

versions of the PES will be assessed with Cronbach alpha and correlations between parity and PES scores will be used to validate the PES.

Multidimensional Scale of Perceived Social Support. Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, 1990). This scale specifically addresses subjective assessment of social support adequacy from three specific sources: family, friends and significant others. The scale has a total of 12 items with three subscales. A 5 point rating scale ranges from very strongly disagree to very strongly agree. Construct validity was established utilizing 275 undergraduate psychology students. Correlations between the MSPSS subscales and the depression and anxiety subscales of the Hopkins Symptom Checklist (HSCL) were found. The MSPSS Family subscale was found to be inversely related to both the depression ($r = -.24$, $p < .01$) and ($r = -.18$, $p < .01$) anxiety subscales. Test-retest reliability at 2-3 months was done with 69 of the 275 original subjects. The test-retest reliability for the significant other subscale was found to be .72, the family subscale was .85, the friends subscale was .75, and the entire scale was .85.

The MSPSS was used to study depressive symptoms in the immediate postpartum period among Hispanic women and a Cronbach's alpha coefficient of .87 was found for the entire scale (Kuo et al., 2004). These 3,952 women were from diverse Mexican, Cuban, Central American, Dominican and South American Hispanic ethnicities. Depression was found to be negatively associated with perceived social support as measured by the MSPSS (OR 0.59, CI 95%). Self-perceived social support remained the strongest predictive factor against depression ($p<.001$) and remained significant in the multivariate model (Kuo et al., 2004). The scale was tested with a sample of bilingual Hispanic women from Mexican, Cuban and Puerto Rican countries of origin

and reviewed by staff nurses from the respected countries of origin. The English and Spanish versions of the MSPSS will be assessed with Cronbach alpha.

Demographic Variables. Demographic variables collected were age, socioeconomic status (level of income and education), parity, smoking status, employment status, age at arrival in U.S., marital status, educational background (level of education and where education occurred) and generation status. Increased age and higher levels of socioeconomic levels have been found to be predictive of breastfeeding practices. Socioeconomic status and age were included in the model since they have been found in the literature to be predictors of breastfeeding behavior and in addition can also confound the relationship between acculturation and parental self-efficacy. For example socioeconomic status can affect how a parent is able to provide for their child and thus could affect perceived parental self-efficacy.

Data Collection and Management

Initiation and infant breastfeeding behavior were obtained from maternal self-report at both time points during hospitalization and at the six week follow up phone call. Prior to hospital discharge a total of 20-30 minutes was required to complete the four self-report measures, data collection tool and to describe the current index of breastfeeding. At six weeks postpartum the index of breastfeeding was assessed again by a telephone call. For mothers who had stopped breastfeeding, the timing of last breast feeding or infant intake of breast milk was documented as well as reason for termination of breastfeeding. If a breastfeeding problem or infant or maternal condition was identified then the maternal or newborn healthcare provider was contacted. In the current study maternal or newborn problems were not identified. This may be due to the follow up phone call occurring at six weeks instead of earlier in the postpartum period. Two referrals were made to community lactation support, Baby café for further lactation support at six weeks

for follow up and further support for return back to work by maternal request. The follow up phone calls lasted about 10 to 15 minutes.

Study data was obtained from paper surveys, entered into excel spreadsheet and kept in a password protected computer. All study forms were stored in a locked cabinet in the PIs office throughout the duration of the study. All questionnaires were coded with a unique identifier. Names of participants were only kept on the informed consent forms.

Data Analysis Plan

Data from the questionnaires, demographic data and information from the medical record were coded and entered into a file in the Statistical Program for Social Sciences, version 21 (SPSS). Data was checked for accuracy of input, skewness and kurtosis, distributions, univariate outliers, and possible range of scores using various programs in SPSS. Three extreme univariate outliers for the MSPSS scale and one extreme outlier for the Hispanic subscale of the BAS were identified and both variables had significant negative skewness and kurtosis. A decision was made to delete the four cases and this significantly reduced skewness and kurtosis for both variables and no further outlier was identified. Mahalanobis distance is a χ^2 distribution with degrees of freedom equal to the number of variables measured and is the distance between central tendency of a score to another score, with the probability of $< .001$ (Tabachnick & Fidell, 2007). Assessment for multivariate outliers, using SPSS regression identified one outlier that exceeded the value of Mahanlanobis distance, χ^2 ($p < .001$) and decision was made to delete the case. After deletion assessment for multivariate outliers was repeated and none were identified. Homoscedasticity is the variability for one continuous variable score to be about the same at all values of another continuous variable (Tabachnick & Fidell, 2007). This is evaluated by producing scatterplots using SPSS and should appear to be of about the same width with some

bulging toward the middle. Heteroscedasticity is the failure of Homoscedasticity, and can be caused by non-normality as well as error of measurement at some levels of an independent variable. Multicolinearity occurs when variables are too highly correlated, > .90, and singularity occurs when variables are redundant, such as one variable is a combination of two or more of the other variables (Tabachnick & Fidell, 2007). Singularity was identified with the AOS subscale and the linear score LAS highly correlated at r = .91, p <.000. Since the AOS score is used to obtain the LAS score this is expected. Multicolinearity was identified with the AOS scale and the Non-Hispanic subscale highly correlated at r = .92, p <.000.

Only participants with complete data on variables of interest for the study data were included. The Pearson product moment correlation coefficient (r) is a measure of size and direction of a linear relationship between two variables, non-linear relationships are not identified (Tabachnick & Fidell, 2007). The measure of strength of the association between two variables is the squared correlation (Tabachnick & Fidell, 2007). The Pearson *r* is used with two continuous variables or one continuous and dichotomous variable. The Spearman correlation coefficient (r_s) can be used for measurements on categorical scales such as the breastfeeding intensity scale, income levels and highest educational level achieved. Correlations explore the relationship between variables. Scatter plots assess the degree of identified correlations and their fit. The intended data analysis technique was use of structured equation modeling and this was limited by sample size. Relationships will be identified and their importance to the hypothesized model will be addressed. The research questions will be addressed for the Mexican country of origin sample.

Analysis by Research Question

Research Question 1: To what extent are breastfeeding behaviors correlated to acculturation levels?

RQ1Hypothesis: As the level of acculturation increases the breastfeeding behavior will decrease.

Bivariate correlations were calculated for the acculturation mean scores for the Hispanic and Non-Hispanic domain and the linear acculturation score with the breastfeeding intensity scale using Spearman (r_s) correlation coefficient. Testing for significant differences on mean acculturation scores and breastfeeding was done with *t* test.

Research Question 2: What is the relationship between the measures of self-efficacy, acculturation and breastfeeding behaviors?

Descriptive statistics were calculated for the Parental self-efficacy (PES) measure as well as the General self-efficacy (GSE) scale. Bivariate correlations were calculated for the PES, GSE and acculturation tools mean subscale scores for each domain, linear score and breastfeeding intensity scale using the Spearman (r_s) correlation coefficient. Testing for significant differences on mean scores and breastfeeding was done with *t* tests.

Research Question 3: Does self-efficacy (parental, general) mediate the role between acculturation and breastfeeding behaviors?

RQ3Hypothesis: If high levels of acculturation are present then high levels of parental self-efficacy may increase the breastfeeding behavior. Yet, if high levels of acculturation are present then low levels of parental self-efficacy may decrease the breastfeeding behavior.

Research Question 4: What are the relationships between social support, age and socioeconomic status, self-efficacy, and breastfeeding behaviors?

RQ4 Hypothesis: Age, SES, and social support and self-efficacy will be positively related to breastfeeding.

Bivariate correlations (Pearson and Spearman) were calculated to determine the relationship between the measures of social support, self-efficacy (PES, GSE), age, and socioeconomic status and breastfeeding intensity scale. Testing for significance difference between mean scores and breastfeeding was done with *t* tests and Chi square for discrete variables.

Research Question 5: To what extent do the relationships between social support, age and SES affect the mediating role of parental self-efficacy between acculturation and parental behaviors specifically breastfeeding behavior?

RQ5 Hypothesis: The mediating role of parental self-efficacy might be stronger, weaker, or the same for the relationships stated above.

This question was dependent on the identification of significant relationships in the model. Use of the statistical methodology, structural equation modeling (SEM) was intended to test the mediating role of parental self-efficacy.

Chapter Four: Results

Sample Recruitment

A total of 342 potential participants were prescreened for participation in the study during the time period from July to December 2011, Table 2 below provides the reasons for failing prescreening. The most common occurrence for failing prescreening was not being from the country of origin specified (Cuba, Mexico, Puerto Rico). After completing prescreening, a total of 65 women declined participation in the study and their reasons provided are listed in Table 3, with the majority not providing a specific reason for declining.

Table 2. Recruitment July thru December 2011 Prescreening of Potential Participants

Reasons for Failing Prescreening	N=342	%
Speaks Dialect not Spanish or Does not read Spanish well	13	3.8%
Not from Country of Origin (Mexico, Puerto Rico, Cuba)	183	54%
Cesarean delivery	78	23%
Hx Drug Use	5	1%
Age below 18	14	4%
Not breastfeeding	34	10%
Multiples	1	0.1%
Infant < 37 wks	12	4%
Infant to Transition Nursery for observation	2	0.1%

Table 3. Eligible Participants that Declined participation

Reason Declined	N= 65	%
No Reason Provided	55	85%
Previous Fraud victim and does not want records	1	1.5%
Stated was too tired	1	1.5%
Interested but discharged home before follow up	8	12%

Preliminary Analysis

Previous power analysis estimated a total of 300 women, with 100 from each country of origin were needed to utilize SEM techniques. Actual recruitment yielded 182 participants that were consented to participate and of these two were dropped from the study because one mother was not breastfeeding and one had a positive urine drug screen, for a total of 180. Unequal sample sizes were obtained with 16 from country of origin Cuba, 31 from Puerto Rico origin and 133 form Mexican country of origin. A total of 28 cases were not included in the analysis due to incomplete data on key variables such as six week infant breastfeeding data and two participants were discharged prior to staff obtaining surveys. Obtaining six week infant breastfeeding data was a challenge as participants were not able to be reached by phone due to disconnected phone numbers. Complete data on all key variables was obtained for N= 152, of which 15 were from Cuba, 22 from Puerto Rico and 115 from Mexican origins. Data obtained from the 115 women of Mexican country of origin was utilized for further data analysis. After preliminary data analysis for normality, three extreme outliers were identified for the social support scale (MSPSS) , 1 extreme outlier for the Hispanic domain Bidimensional Acculturation Scale (BAS) and one case was identified as a multivariate outlier identified by the Mahanlanobis distance statistic (Tabanick &Fidell, 2007). These five cases were identified as outliers and reviewed and the decision was made to delete. Deletion of these cases provided improvement of kurtosis for the MSPSS and Hispanic domain BAS scale and no further multivariate outliers were identified. Due to inability to obtain equal sample sizes from three countries of origin, data analysis was performed on the sample of N = 110 for the Mexican country of origin for descriptive and comparative analysis.

Sample Demographics

Sample demographics for the Mexican country of origin participants, N=110 are listed in Table 4. This sample had a mean age of 26.3 ± 5.2 years and was closely evenly split between single and married status. Completion of the study surveys was done in Spanish 82% of the time and 71% of the participants were of first generational status. The PI and research assistant were bilingual and option for study surveys in both languages was always offered. Educational attainment was low overall, with 30% having grammar school as highest level and 36% as middle school. Income levels reported were low with about 80% of the sample having a yearly income below $14,999 a year. Intending to work in the postpartum period was reported during hospitalization by 36% of the sample but only 16% reported working at 6 weeks during the follow up phone call. Table 5 provides the intention to work and types of jobs reported at the six weeks follow up call. Intention to return to work postpartum was reported by 36% of the women during hospitalization but only 16% were actually working or in school at the six week follow up call. The type of work was described as labor such as farm worker or packaging factory by 28%, retail and waitress by 28%, office work by 22% and professional work 2% and attending school by 2%. More than 80% of the sample previously had children and 65% reported previously breastfeeding. Participation with WIC was very high at 92%. Only 17% of the sample reported attending a breastfeeding class, but this is not surprising since the majority of the sample had previously breastfed. Participants reporting problems with breastfeeding, specifically latching their infants was low at 16%. The sample was recruited from the low risk postpartum floors and all were vaginal deliveries, as cesarean delivery was an exclusion to participate in the study.

Table 4: Sample Demographics and Breastfeeding Characteristics.

Variables	(N= 110)
Age (mean years ± SD)	26.3 ± 5.2
Age to US (mean years ± SD)	14.7 ± 8.4
Marital Status	
Single	51% (56)
Married	49% (54)
Education	
Grammar School	30% (33)
Middle School	36% (39)
High School Graduate	22% (24)
College Graduate	11% (12)
Post Graduate Study	2% (2)
Income	
Under $4,999	37% (41)
$5,000-14,999	42% (46)
$15,000-24,999	18% (20)
$25,000-39,999	3% (3)
Primipara	20% (22)
Mulitpara	80% (88)
Smoking (yes)	1% (1)
WIC Participation (yes)	92% (101)
Attended BF Class (yes)	17% (19)
Previous BF Experience (yes)	65% (71)
Received BF Advice (yes)	64% (70)
BF Help Hospital Stay (yes)	61% (67)
Latch Problem Yes	16% (18)
Latch Problem No	84% (92)

Table 5: Intent to Work Postpartum, Working Status and Type of Job at 6 weeks.

Variables	(N= 110)
Intent to Work pp	36% (39)
Working at 6 wks	16% (18)
Type of Job	n=18
Labor/Empacadora	28% (5)
Office	22% (4)
Retail/Waitress	28% (5)
Professional	11% (2)
School	11% (2)

Results of Analysis

Aim 1: To assess the relationship between acculturation and parental behaviors specifically breastfeeding behaviors.

ResearchQ1: To what extent are acculturation levels and breastfeeding behaviors correlated?

Using both acculturation tools mean scores were calculated for both subscales of each domain (Hispanic and Non-Hispanic). A linear acculturation mean score (LAS) was obtained from the ARSMA II scores. Breastfeeding was measured at six weeks based on the levels of breastfeeding intensity on the categorical scale for the sample and as a dichotomous outcome.

The acculturation scores for the bidimensional tools are listed in Table 6. Using the ARSMA II, the Linear Acculturation Score (LAS) sample mean was -1.96 ± 1.17, indicating an overall stronger orientation to the Hispanic domain. The Mexican Orientation Subscale (MOS) sample mean was 4.29 ± .50, with a Cronbach's alpha of .84, indicating good scale reliability. The Anglo Orientation Subscale (AOS) sample mean was 2.33 ± 1.02, with a Cronbach's alpha of .93, indicating good scale reliability. The LAS scores were used to categorize the sample into More Hispanic (LAS > 0.5 SD below the mean), More Americanized (LAS > 0.5 SD above the mean) or Bicultural (LAS ± 0.5 SD) (Chapman & Perez-Escamilla, 2013). The sample was divided into 41% for the More Hispanic, 26% for the Bicultural and 33% for the Americanized. The Bidimensional Acculturation Scale (BAS) does not produce a linear acculturation score but provides two cultural domain scores. The Hispanic domain mean was 3.58 ± .42, indicating strong Hispanic orientation with a Cronbach's alpha of .85 for good scale reliability. The non-Hispanic domain mean was 2.03 ± .96, with a Cronbach alpha of .97. Scoring above 2.5 in both domains is categorized as Bicultural (Marin & Gamba, 1995). The current sample had 28%

categorized as bicultural, defined as a mean score > 2.5 in both BAS Hispanic and Non-Hispanic domains.

Table 6: Acculturation scales

Acculturation Scales	N= 110	Cronbach's Alpha
ARSMA		
Range (1-5)		
MOS (mean ± SD)	4.29 ± .50	.84
AOS (mean ± SD)	2.33 ± 1.02	.93
Linear score (AOS mean -MOS mean)	-1.96 ± 1.17	
More Hispanic	41% (n= 45)	
Bicultural	26% (n= 29)	
More American	33% (n= 36)	
BAS		
Range (1-4)		
Hispanic (mean ± SD)	3.58 ± .42	.85
Non-Hispanic (mean ± SD)	2.03 ± .96	.97
Bicultural	28% (n=31)	

Note: ARSMA= Acculturation Rating Scale for Mexican Americans II Cuellar & Maldonado, 1995); MOS= Mexican Orientation Scale; AOS=Anglo Orientation Scale; BAS= Bidimensional Acculturation Scale (Marin & Gamba, 1996).

Breastfeeding at six weeks was measured during the follow up phone call by asking how mothers were feeding their infants during the last 24 hrs. This information obtained was then put into a five category scale with 4= exclusive breastfeeding (not providing formula), 3= >80% breastfeeding (20% feeds were formula), 2= 20-80% breastfeeding (20-60% were formula), 1= <20% breastfeeding (80% of the feedings were formula), 0= formula feeding (No breastfeeding

at all). Infant feeding at the six week time period is listed in Table 7 and Table 8 lists the Intensity of breastfeeding for the sample.

Breastfeeding outcomes at 6 weeks were also categorized into three levels exclusively breastfeeding (exclusive breast milk feedings), breastfeeding and formula feeding and exclusively formula feeding. The sample had 17% of mothers report EBF (no formula provided to infant), 64% were feeding breast milk and formula, and 19% were not breastfeeding and only providing formula. In addition, the sample was categorized into breastfeeding and not breastfeeding for analysis purposes, 81% (n=89) for breastfeeding and 19% (n=21) formula feeding only.

Table 7: Infant feeding at 6 weeks

Infant Feeding at 6 Weeks	(N= 110)
Formula Feeding	19% (21)
Any Breastfeeding	81% (89)
Exclusive Breastfeeding	17% (19)
Breast/Formula	64% (70)

Note: Exclusive Breastfeeding= No formula.

Table 8: Intensity of Breastfeeding at Six Week Follow-up Call

Scale	Breastfeeding Intensity	N=110
4	Exclusive Breastfeeding (No formula)	19 (17%)
3	>80% Breastfeeding/Breast milk	29 (26%)
2	20-80% Breastfeeding/Breast milk	39 (35%)
1	<20% Breastfeeding/Breast milk	2 (2%)
0	No Breastfeeding/Breast milk	21 (19%)

Note: Intensity of Breastfeeding obtained from 24 hour recall of infant feeding.
Exclusive Breastfeeding= No formula.

Table 9: Correlations of Main Study Variables.

	1	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12
1. BF Scale r_s	**1**	.17	-.01	-.06	-.04	-.02	-.03	-.15	.01	**-.23***	-.07	-.07
2. Age		1	.10	-.19	**-.31†**	**-.30†**	.12	**-.34†**	.12	.15	.07	-.01
3. Income r_S			1	.17	**.20†**	**.21†**	-.06	**.25†**	-.11	.15	-.05	.15
4. Education r_s				1	**.49†**	**.60†**	.04	**.58†**	-.09	.03	-.12	.17
5. ARSMA Linear					1	**.91†**	**-.50†**	**.87†**	**-.50†**	.03	-.02	.01
6. AOS						1	-.08	**.92†**	**-.29†**	.06	.01	.02
7. MOS							1	-.17	**.60†**	.04	.05	.03
8. Non-Hispanic BAS								1	**-.39†**	.08	.01	.01
9. Hispanic BAS									1	.09	.03	.10
10. PES										1	**.46†**	**.20***
11. GSE											1	.09
12. MSPSS												1

Note: r_s = Spearman correlation statistic. * = Correlation is significant at the 0.05 level (2-tailed). † = Correlation is significant at the 0.01 level (2-tailed). AOS= Anglo domain of the Acculturation Rating Scale for Mexican Americans II (ARSMA) (Cuellar & Maldonado, 1995). MOS= Mexican domain of the ARSMA Scale (Cuellar & Maldonado, 1995). Non-Hispanic BAS = non-Hispanic domain of the Bidimensional Acculturation Scale (BAS) (Marin & Gamba, 1996). Hispanic BAS= Hispanic domain of BAS (Marin & Gamba, 1996). PES= Parental Expectation Survey (Reeves,1992), a measure of Parental Self-Efficacy. GSE= General Self-Efficacy scale (Schwarzer, 1995). MSPSS= Multidimensional Scale of Perceived Social Support (Zimet, 1990).

Breastfeeding at 6 weeks based on the levels of breastfeeding on the categorical scale was not found to be correlated significantly with any of the acculturation measures, ARSMA LAS score, Non-Hispanic subscales and Hispanic subscales of both acculturation scales. Table 9 has the correlations of the main study variables.

The BAS Non-Hispanic subscale had significantly different mean scores for breastfeeding outcomes, t = -2.24, df=108, p =.03, 95% CI= -.97 - -.06. There were no significant differences found for breastfeeding for the ARSMA Linear scores, AOS and MOS subscale and the BAS Hispanic domain subscale. Data are presented below in Table 10.

Table 10: Acculturation Measures and Breastfeeding Outcomes

Bidimensional Acculturation Scales	Breastfeeding At 6 weeks n=89	Not Breastfeeding At 6 weeks n=21	*P*
ARSMA			
Range (1-5)			
MOS (mean ± SD)	4.28 ± .52	4.31 ± .41	.79
AOS (mean ± SD)	2.26 ±. 96	2.63 ± 1.21	.20
Linear score (AOS mean -MOS mean)	-2.03 ± 1.14	-1.69 ± 1.27	.23
BAS			
Range (1-4)			
Hispanic (mean ± SD)	3.58 ± .42	3.56 ± .45	.83
Non-Hispanic (mean ± SD)	1.93 ± .91	2.44 ± 1.07	.03*

Note: ARSMA= Acculturation Rating Scale for Mexican Americans II Cuellar & Maldonado, 1995); MOS= Mexican Orientation Scale; AOS=Anglo Orientation Scale; BAS= Bidimensional Acculturation Scale (Marin & Gamba, 1996).

The acculturation scales used had strong correlations with variables known to be proxies for acculturation, demonstrating construct validity. First generation status was positively correlated with both Hispanic subscales: MOS (r = .20, p =.04) and the BAS Hispanic (r = .33, p =.001). First generation status was strongly negatively correlated with both Non-Hispanic subscales, the AOS (r = -.71, p = .00), and BAS non-Hispanic (r = -.76, p =.00), as expected. Table 11 lists the

proxy acculturation variables for the study and Table 12 provides correlations among acculturation scores and proxy acculturation variables.

Table 11: Proxy Acculturation Variables

Variables	(n= 110)
Age to US (mean years ± SD)	14.7 ± 8.4
Time in US (mean years ± SD)	11.6 ± 6.8
1st Generation	71% (78)
1.5 Generation	14% (15)
2nd Generation	15% (17)
Spanish Survey	82% (90)
English Survey	18% (20)
MGM in U.S (yes)	44% (48)
Mother breastfed as child (yes)	80% (88)

Note: MGM= Maternal Grandmother.

Table 12: Correlations of Proxy Acculturation Variables and Acculturation Measures

	Age to US	Time in US	Linear Acculturation ARSMA	AOS	Non-Hispanic BAS	MOS	Hispanic BAS
Age to US	1	-.79†	-.70†	-.72†	-.78†	.20*	.37†
Time in US		1	.64†	.66†	.70†	-.15	-.36†

Note: * = Correlation is significant at the 0.05 level (2-tailed). † = Correlation is significant at the 0.01 level (2-tailed). AOS= Anglo domain of the Acculturation Rating Scale for Mexican Americans II (ARSMA) (Cuellar & Maldonado, 1995). MOS= Mexican domain of the ARSMA Scale (Cuellar & Maldonado, 1995). Non-Hispanic BAS = non-Hispanic domain of the Bidimensional Acculturation Scale (BAS) (Marin & Gamba, 1996). Hispanic BAS= Hispanic domain of BAS (Marin & Gamba, 1996).

AIM 2: To assess the plausible mediating role of self-efficacy between acculturation and breastfeeding at 6 weeks.

ResearchQ2: Does parental self-efficacy and general self-efficacy scores correlate with acculturation levels and breastfeeding outcomes at 6 weeks?

ResearchQ3: To what extent does parental self-efficacy mediate the effect of acculturation on breastfeeding behavior?

The Parent's Expectation Survey (PES) was used to measure parental self-efficacy, mean scores for the sample were high 8.52 ± 1.31 (range 0-10), and a Cronbach's alpha of .94 was obtained for the sample. The General Self-efficacy scale also had high mean scores, 3.28 ± .60 (range 1-4) and a Cronbach alpha of .87 for the sample. The PES and GSE scores were not found to correlate significantly with the ARSMA LAS score, or the ARSMA subscales, or the BAS subscales. The MPSS, GSE AND PES scale descriptive measures are listed in Table 13 and Table 9, listed above shows the correlations among the main study variables.

Table 13 Social Support and Self-Efficacy Measures for sample

Variable	N=110	Cronbach's Alpha
Multidimensional Scale of Perceived Social Support (MSPSS) Range 1-5 (mean ± SD)	4.37 ± .63	.87
Parental Self-Efficacy (PES) Range 0-10 (mean ± SD)	8.53 ± 1.31	.94
General Self-efficacy (GSE) Range 1-4 (mean ± SD)	3.28 ± .60	.87

Note: Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, 1990); Parental Self-Efficacy measured using the Parent's Expectation Survey (PES) (Reece, 1992); General Self-Efficacy (GSE) (Schwarzer, R.J., 1995).

Parental self-efficacy (PES) scores were found to have negative correlation with breastfeeding at six weeks based on the levels of breastfeeding on the categorical scale, r_s rs = -.23 (p= .01). This was not in the hypothesized direction.

PES and GSE measures were tested to detect differences in mean scores on PES and GSE depending on parity (1st baby vs not 1st baby) and significant differences were not found for either measure, (t = -1.14, df= 108, p=.26; t=-.047, df=108, p=.96) respectively. In addition a significant correlation was not identified for PES and parity as expected (r = .03, p =.76). A significant correlation was not identified between measures of GSE and PES for the sample and the breastfeeding outcomes at 6 weeks, listed in Table 9. Significant differences were not detected in mean scores for the General Self-Efficacy (GSE) and Parental Self-Efficacy (PSE) scales and breastfeeding, data presented below Table 14.

Table 14: Measures of Self-Efficacy and Breastfeeding outcomes at 6 weeks

Measures	Breastfeeding At 6 weeks n=89	Not Breastfeeding at 6 weeks n=21	*P*
Parental Self-Efficacy (PES) (mean ± SD) Range 0-10	8.46 ± 1.30	8.81 ± 1.33	.26
General Self-efficacy (GSE) (mean ± SD) Range 1-4	3.27 ± .61	3.28 ± .56	.96

Note: Parental Self-Efficacy measured using the Parent's Expectation Survey (PES) (Reece, 1992); General Self-Efficacy (GSE) (Schwarzer, 1995).

AIM 3: To what extent does social support, age, and socioeconomic status relate to self-efficacy and breastfeeding outcomes.

ResearchQ4: What are the relationships between social support, age and socioeconomic status, self-efficacy and breastfeeding behaviors?

ResearchQ5: To what extent do the relationships between social support, age and SES, affect the mediating role of parental self-efficacy between acculturation and breastfeeding at 6 weeks.

Social support as measured using the Multidimensional Scale of Perceived Social Support (MSPSS) had mean scores for the sample of 4.37 ± .63, (range 1 -5) high scores overall and a Cronbach alpha of .87 for the sample. These scores are listed in Table 12. The MSPSS was translated into Spanish for the study. The Spanish language from Cronbach alpha was .86. Recoding of the survey questions was done (1=5) (2=4) (3=3) (4=2) (5=1), for interpretation with higher scores indicating higher levels of social support. Correlations were estimated for measures of self-efficacy and social support, age, income and education and breastfeeding outcomes and are listed in Table 9.

General Self-efficacy as measured by the GSE was not found to correlate with any of the variables of interest. Both Self-efficacy (GSE & PSE) scales were positively correlated at r = .46, p=.001, as expected. Social support as measured using the Multidimensional Scale of Perceived Social Support (MSPSS) and was found to have a weak, positive correlation with Parental Self-Efficacy (PES) r =.20, p= .04.

Income and education were not found to correlate significantly with each other as expected, r_s = .17, p =.07. Age was found to correlate significantly with the linear ARSMA LAS score, r = -.31, p=.001, and with both Non-Hispanic domains (AOS, r = -.30, p =.001, Non-Hispanic BAS, r = -.34, p = .001). Income and the ARSMA LAS score were correlated r_s = .20, p= .05, as well as both Non-Hispanic domain subscales, (AOS r_s =. 21, p =.001, BAS Non-Hispanic r_s = .25, p = .001). Income and Age did not correlate with either of the Hispanic domain subscales. Income was not found to correlate with either breastfeeding outcomes.

Education was found to correlate strongly with the ARSMA LAS score r_s = .48, p = .001, and both Non-Hispanic domains (AOS, r_s = .60, p = .001, BAS Non-Hisp, r_s =.58, p = .001). Education was not found to correlate significantly with either of the Hispanic domain scales. Education was found to have a negative weak correlation with breastfeeding outcomes, r_s = -.24, p = .01.

Age and social support mean scores were assessed with *t* tests to detect differences for breastfeeding; results are listed below in Table 15. Only age was found to be significantly different for breastfeeding, older women more likely to be breastfeeding. Using Chi Square, income and education were assessed to detect difference in breastfeeding outcomes, but 30-40% of counts in cells were found to be less than 5 which is the minimum required, which limits the interpretation of the analysis (Income, χ^2 = 2.36, df=3, p = .50) (Education $\chi^{2=}$ 6.8, df=4, p= .14).

Table 15: Age and Social Support by Breastfeeding Outcomes

Measures	Breastfeeding At 6 weeks n=89	Not Breastfeeding at 6 weeks n=21	*p*
Age	26.88 ± 5.2	24.1 ± 4.35	.03*
Social Support MSPSS	4.35 ± .66	4.44 ± .46	.56

Lack of significant relationship between breastfeeding outcomes and parental self-efficacy and acculturation measures does not allow for testing of mediating role of parental self-efficacy.

Supplemental Analysis

Utilizing two bidimensional acculturation tools allowed for comparison of how participants are classified into acculturation levels. Tools were compared using cross tabulation for bicultural categories. The ARSMA Linear (LAS) scores were categorized into three groups, More Hispanic (LAS > 0.5 SD below the mean), Bicultural (LAS ± 0.5 SD), or More Americanized (LAS > 0.5 SD above the mean) (Chapman & Perez-Escamilla, 2013). The sample was divided into 41% for the More Hispanic, 26% (29) for the Bicultural and 33% for the Americanized. The Bidimensional Acculturation Scale (BAS) does not produce a linear acculturation score but provides two cultural domain scores and scores > 2.5 in both domains are considered Bicultural. The current sample had 28% (31) categorized as bicultural, defined as a mean score > 2.5 in both BAS Hispanic and Non-Hispanic domains. A cross tabulation, was done and differences were noted in the women that were classified as bicultural for each tool, results presented below in Table 16. The BAS bicultural category had 96.8% of women who were categorized as More Hispanic by the ARSMA LAS categories. This would provide different selection of participants and different meaning for use of the bicultural category for both tools and can impact results.

Table 16: Biculturalism Category for BAS and ARSMA II Scales

Bidimensional Acculturation Scale	Acculturation Ratings Scale for Mexican Americans II			
	More Americanized	Bicultural	More Hispanic	Total
Bicultural				
No	45	28	6	79
Yes	0	1	30	31
Total	45	29	36	110

Infant Breastfeeding Behavior

The first infant feeding of life during hospitalization is reported in Table 17, and included breastfeeding for more than 50% of the sample. The breastfeeding intensity was documented for feedings during hospital stay and assessed at the six week follow up phone call by asking mothers to recall feeding during the last 24 hours; this information is presented in Tables 18 and 19. Of those who intended to exclusively breast feed (EBF) n=11, only three were still exclusively breastfeeding at six weeks. Of those who intended to EBF but were breast/formula during the hospital stay n = 7, three of them were actually breastfeeding and not providing any formula at six weeks. In the mothers who intended to breast and formula feed (n= 91), only 12 were exclusively breastfeeding and not providing formula at six weeks. At the six week follow up phone call the practice of exclusively breastfeeding (not giving formula) increased overall, but only 3%; three remained exclusively breastfeeding from the hospital stay to the six week follow up call.

Table 17: Infant First Feeding during Hospitalization

Infant First Feeding	N=110
Breast	53% (58)
Breast/Formula	7% (8)
Formula	40% (44)

Table 18: Infant Breast Feeding Intensity during Hospitalization

Exclusive Breastfeeding	10% (11)
High > 80%	30% (33)
Medium 20-80%	42% (46)
Low < 20%	17% (19)
Totals	99%(109)

Table 19: Feeding during Hospital Stay and Feeding at 6 week follow up

Feeding during Hospital Stay		Exclusive Breastfeeding at 6 Weeks	Breast/Formula at 6 Weeks	Formula Only at 6 Weeks
Exclusive Breastfeeding	11(10%)	3	6	2
Breast/Formula	98(83%)	15	64	19
Only Formula Feeding	1 (1%)	1	0	0
Totals	110	19 (17%)	70(63%)	21 (20%)

Note: Exclusive Breastfeeding= Only breast milk, no formula; Breast/Formula= infant feeding at breast or receiving breast milk and also taking formula.

The practice of exclusive breastfeeding or providing only breast milk was low at only 17% (n = 19) at the six week follow up call for this sample. Women were asked how their current infant was feeding during their hospital stay (exclusively breastfeeding (only breast milk), partial breastfeeding (breast milk and formula), no breastfeeding (formula only) and they were able to write in their response for why they choose this method. For Spanish surveys these responses were translated into English by the PI. Focusing on the women who reported exclusive breastfeeding during the six week follow up call, further description of reasons why these women were breastfeeding during hospitalization as well as work and pumping status at 6 weeks is provided and summarized in Table 20 below. For seven of the 19 mothers, reasons for breastfeeding included how it was "healthy" and providing "protection", as well as for a "smart and big baby" and "easier to digest". These comments show that these women value the infant health benefits of breast milk. "Going back to work", was only reported by two of the 19 mothers and at the six week follow up call only one mother reported actually working and she was pumping at work. At six weeks one of these mothers reported having to soon stop breastfeeding and start providing formula as she would not be able to pump at work. In addition, a mother reported she was breastfeeding because "baby wouldn't take the bottle" and that she intended to work later but was not working at the six week follow up call.

Seven mothers who were feeding formula and breast during the hospital reported that their infants were “not being full” on the breast or that “not much milk” was in their breasts. Two mothers reported breastfeeding because it was the “normal way”, for why they were feeding. One mother described having trouble latching and was only providing formula during hospital stay but felt that “when I get home it will be better.” She was not working at the six week follow up call and providing only breast milk. Pumping was reported by six of the 19 mothers who were exclusively breastfeeding at the six week follow up call.

Chapter Summary

This chapter provided the results of the study with a focus on identifying relationships among the variables of interest presented in the model. A significant relationship was not identified for Acculturation measures and the breastfeeding intensity scale. The BAS Non-Hispanic domain mean scores were found to be significantly different for those breastfeeding. Age was found to be positively associated with breastfeeding outcomes as expected. Parental self-efficacy was inversely associated with breastfeeding, an unexpected finding. A significant relationship was not identified for parental self-efficacy and acculturation measures for this sample. Income and education were not found to be correlated as expected, yet each was found to be associated with measures of the acculturation. Social support was only found to be associated to measures of parental self-efficacy. Additional analysis was presented for the measure of biculturalism and further description of breastfeeding practices for the exclusively breastfeeding mothers at six weeks. These findings will be interpreted and chapter V will provide significance of findings to future research and address limitations of the current study.

Table 20: Exclusive Breastfeeding at 6 Weeks (n=19), Reasons and Working /Pumping Status at 6 weeks.

Hospital Infant Feeding	Reason for infant feeding during hospital stay	Feeding at 6 weeks	If working or pumping and additional information provided at 6 week follow up call.
EBF n=3			
	"Because it protects her development and from sickness.. So that she can have a healthy life."	Breastfeeding	Not working and not pumping. "But will need to start formula soon since not able to pump at work."
	"It is more healthier and has less risk of my baby getting sick"	Breastfeeding	Not working and not pumping. "I only like to breastfeed my children never give bottles.."
	"Only breast because it is healthier for my baby"	Only Breast Milk	Not working and did use manual pump. "..because family bonding, convenient and nutrition.."
Breast & formula feeding n=15			
	"Because it is the most normal way.."	Breastfeeding	Not working or using pump. "because I like it and I like my baby feeding from me."
	"Because it's better for her, they have good formula but it's more difficult for them to digest the formula…. And I did breastfeed my other children and I want to bond with my baby girl."	Breastfeeding	Not working or using pump. ''Baby eats frequently.."
	"It (breastfeeding) is much better for her development."	Breastfeeding	Not working and not using pump. "..Best for baby."
	"Breast milk and formula because if doesn't get full with breast.. give a little bit of formula so not still be hungry"	Breastfeeding	Unsure if working or pumping.
	"…going back to work that's why I give formula too."	Only breast milk	Working full time and pumping at work.
	"Will stick to breast"	Only breast milk	Not working but plans to go back to school. Does pump sometimes.
	"I want to only breastfeed, because I want my child to be big and very smart and because it is the best".	Breastfeeding	Not working or pumping.
	"I gave formula because my breasts are not full yet and the baby does not get full"	Breastfeeding	Not working or pumping. Has WIC apt and not sure what to do with the formula WIC will provide. Counseled on EBF package from WIC.

	"At first felt that she was not getting full and decided to give her milk (formula) for now."	Breastfeeding	Not working or pumping. "Best for baby's health".
	"..Because it is the most normal… cradle hold."	Breastfeeding	Not working or pumping. "..because I like it and I like my baby feeding from me."
	"..Because I still don't have milk."	Breastfeeding	Not working or pumping. Providing vitamins. "Because it is healthier"
	"Meanwhile the milk comes in; I combine formula and breast, but try to give more breast milk. "	Breastfeeding	Not working and has pump. Requested information on breast milk storage and providing bottles of breast milk. "Even though it takes her more time to feed at breast and at night, benefits outweigh."
	"..Because I don't have much milk."	Breastfeeding	Not working or pumping. "Easier and better for health."
	"..Because the baby doesn't take the bottle, so that he doesn't get sick but later will give both since I will go back to work."	Breastfeeding	Not working and used manual pump initially but not anymore. Has provided water and counseled. "Best for health"
	"..Because the breast milk helps the baby a lot and not to spend a lot on formula."	Breastfeeding	Not working or using pump. "Best for baby."
Only providing Formula n=1			
	"Actually I am not giving breast because it takes time to come out, difficulty latching on to breast…..when I get home it will be better"	Only breast milk	Not working and doing some pumping.

Chapter V: Discussion

The associations between variables of interest depicted in the model, Figure 2, were assessed and study findings and results interpreted. The implications of these findings for future research will be provided in this chapter.

This is the first study to have used two bidimensional acculturation tools and explore their relationships between breastfeeding outcomes. The Non-Hispanic domain subscale of the BAS was the only acculturation measure found to be associated with breastfeeding outcomes at 6 weeks for the study. The BAS Non-Hispanic domain subscale scores were significantly different for those breastfeeding compared to those formula feeding, indicating higher levels of Non-Hispanic domain acculturation associated with not breastfeeding. The BAS tool measures language acculturation in Hispanic and Non-Hispanic domains, inquiring regarding choice of language when reading, writing or talking as well as media use. The majority of the women in the study chose to complete study surveys in Spanish (82%). The Hispanic domain subscales were not found to be associated with any of the variables of interest but did have correlations as expected with acculturation measures. This sample was majority first generation (71%) and had an overall stronger orientation to the Hispanic domain. Income was found to be significantly associated with the ARSMA Linear Acculturation measure (LAS) and both Non-Hispanic domain subscales (ARSMA & BAS). Women with higher incomes were more likely to be acculturated to the U.S. and this makes sense as longer stay and increase use of the English

language may provide opportunities for better employment and higher incomes. The Non-Hispanic domain and Linear Acculturation scores may have been more sensitive in detecting these associations for this sample. Breastfeeding at six weeks were found to be negatively associated with education, indicating higher educational attainment had greater association with not breastfeeding. This finding is in opposition of what is found in the majority of the U.S. population, but in this sample higher education may have increased ability to obtain work and in this manner affected breastfeeding negatively.

Income and education were not found to be related as expected, $r = .17$, $p = .07$, it was approaching significance for this sample. Sixty six percent of women in this sample had not graduated from high school and 79% reported an annual income of less than $15,000. This occurrence is puzzling as the majority of sample had low education and low income.

Proxy variables of acculturation were found to be associated in the hypothesized direction with breastfeeding outcomes. Time in US was found to be negatively correlated with breastfeeding outcomes as identified in previous research (Harley et al., 2007). Age at arrival to U.S. was found to be positively associated with breastfeeding outcomes. This may suggest that the older the age at arrival to the US, the more likely breastfeeding behavior increased. Older age at arrival to US may have provided more time for exposure to experiences and socialization of country of origin breastfeeding practices, making breastfeeding a natural choice. Rates of exclusive breastfeeding in Mexico are lower than those reported for the general U.S. population, and this may present as part of the reason for low practices in the U.S. (Gonalez de Cossio et al., 2013).

The Parent's Expectation Survey (PES), a measure of parental self-efficacy was found to be negatively associated with breastfeeding outcomes using the breastfeeding intensity index. This

finding is in the unexpected direction, with higher parental self-efficacy associated with decrease breastfeeding intensity. Following Social Cognitive Theory assumptions, the more behavior specific the cognitions are the stronger the relationship with the targeted behavior is expected (Bandura, 1997). Currently, there exists a tool designed to measure breastfeeding self-efficacy (BSEF) and it has been translated and used with Spanish speaking community samples (Oliver-Roig, 2011). Use of the BSEF measure would provide a more specific measure of self-efficacy for the targeted behavior of breastfeeding and a stronger relationship would be expected following SCT assumptions (Bandura, 1997). In addition, this Mexican origin sample of women may not have associated higher intensity of breastfeeding or exclusive breastfeeding with higher levels of parenting self-efficacy. Mixed feeding or Las Dos, is a common finding among Hispanic women especially for the Mexican origin community and exclusivity may not have been perceived as higher value then mixed feeding or formula feeding (Bunik et al., 2006). Hispanic women of predominately Dominican origin (6% Mexican), were interviewed regarding their beliefs about breastfeeding, colostrum and infant formula at a community hospital and clinic in Massachusetts (Bartick & Reyes. 2012). Women were not aware of medical recommendations for exclusivity and breastfeeding or of the dose-response effect of breastfeeding and felt that even a few weeks of breastfeeding would be sufficient for their baby to be healthy (Bartick & Reyes, 2012). This may explain the unexpected finding of higher levels of parenting self-efficacy associated with lower levels of breastfeeding.

An integrated literature review identified statistically significant increases for maternal parenting self-efficacy over baseline measures with time, a positive relationship with number of children, social support and maternal parenting satisfaction (Leahy-Warren & McCarthy, 2011). The PES measure was not repeated at 6 weeks and the measure was obtained within 48 hours of

the infants' birth; over time an increase in PES scores would be expected with exposure to positive parenting experiences and ultimately improved parenting self-efficacy. We did not inquire regarding past experiences of parenting that these women already had before the birth. In addition, this sample was experienced, with 80% of mothers having had previous children and 70% having previously breastfed. The PES scores were not able to discriminate between parity (first child vs not first child) for this sample as has been identified previously in the literature, with greater parental self-efficacy predicted by multiparty (Mercer & Ferketih, 1994). Social support as measured by the Multidimensional Scale of Social Support (MSPSS) was found to have a positive relationship with parental self-efficacy for this sample as previously seen in the literature (Leahy-Warren & McCarthy, 2011). This study was the first to utilize the Spanish translation of the PES and the MSPSS scales and both had measures of Cronbach alpha's that were high in each language version.

Acculturation was not found to be associated with the self- efficacy measures (parental and general). This sample had high scores on both measures of self-efficacy. The General self-efficacy scale single dimensionality and global construct was validated among 19,120 participants from 25 countries (Scholz et al., 2002). Latino countries included in the 25 countries studied were Costa Rica, Peru and Spain. The GSE and social-cognitive constructs, well-being, health behaviors and coping with stress, have been found to initially have similar findings across the samples and countries studied, yet the authors ask for further testing across countries that differ in social, economic, and cultural backgrounds (Scholz et al., 2002).

At six weeks the practice of exclusively breastfeeding (not giving formula) increased for this Mexican country of origin sample (17%), this is about 50 % lower than the 46% goal set for exclusive breastfeeding at three months by the Healthy People 2020 (HHS, Healthy People 2020,

2013). It is important to note that this 17% rate of EBF is reported at six weeks and it is unknown if at three months this rate would remain constant, increase or even decrease. In this study, of the women who were exclusively breastfeeding in the hospital (n= 10) only 3 were still exclusively breastfeeding at 6 weeks. These low rates are not surprising as Hispanic women have been reported to have the lowest rates of EBF in a culturally diverse sample with rates of EBF at 44.7% at hospital discharge and dropping to 19.1% at one month postpartum (Petrova et al., 2007). This presents a unique opportunity in which targeting Hispanic mothers after discharge may assist in increasing further the rates of exclusive breastfeeding.

Returning to work in the postpartum was reported by 36 % (39) for the entire sample. At the six week follow up call only 16% (18) reported actually working. Focusing on the women who were exclusively breastfeeding (n=19) only one reported actually working. She was working full time at a fast food restaurant and able to pump at work. Two other women reported soon starting school or work. The mother who reported going back to school was already pumping in preparation. While the woman who reported soon starting work would have to stop breastfeeding and start formula as she was not able to pump at work. She reported returning to work on a farm and that providing the baby expressed breast milk would not be possible at the daycare. These three women each provide realistic examples of potential outcomes when mothers need to return to work or school postpartum. Type of job and employer constraints impact the ability to be able to pump and obtaining access to effective breast pumps is a barrier due to their high cost. The Affordable Care Act legislation supports access to breast pumps and the right to pump at work but specific details of the law and lack of enforcement of this law is limiting. Currently it is possible to obtain breast pumps at no cost under some private insurances but this is not always

the case for those with Medicaid, making access to breast pumps even more difficult for this low income population.

In addition, WIC participation was high with 92% of women enrolled and this provides exposure to formula advertising and access to free formula. Immigrant women may see formula use as high status, as cost and access may be prohibitive in country of origin and formula feeding may be seen as the feeding method of choice in the U.S. Given this strong potential influence the question of whether WIC drives the breastfeeding practices as opposed to the influence of acculturation exists. The identified current trend of decreasing exclusive breastfeeding rates and increase in supplementation for rural and Indigenous communities in Mexico presents evidence to changes occurring prior to settlement (Gonalez de Cossio et al., 2013). Improved breastfeeding indicators were found for Mexican women of higher socioeconomic status, older and higher education(Gonalez de Cossio et al., 2013). This trend mirrors demographics consistent with improved breastfeeding rates for White women in the U.S. These observations provide initial evidence that these changes are occurring in Mexico, prior to settlement in the U.S. and they may be further exaggerated by the availability and easy access to free formula from WIC.

Recommendations for Breastfeeding Interventions

Women of Mexican origin with lower levels of acculturation have been found to have higher breastfeeding rates compared to their U.S. born counterparts (Harley et al., 2007, Beck, 2006). Recently a reverse in trends was identified with higher EBF rates found for U.S born Latinas compared to foreign born Latinas at a hospital that achieved baby friendly designation. (Newton, CahudhurI & Grossman et al., 2009). Hospitals that adhere to the Baby Friendly Hospital Initiative (BFHI) and follow the Ten Steps to Successful Breastfeeding have been shown to

increase their rates of exclusive breastfeeding even with patient populations that are more than 75% Hispanic (California, 2009). Encouraging the use of evidence base maternity care practices that support breastfeeding such as the BFHI has the potential to reduce breastfeeding disparities which can directly impact maternal and child health outcomes. Use of risk-based language when counseling regarding the introduction of formula, as well as providing education regarding the dose response relationship between breast milk and health can help in reducing the rate of mixed feeding (Bartick & Reyes, 2012).

Future interventions to promote EBF for Hispanic women need to include education regarding pumping, increase access to pumps at free or low costs and increase the number of Spanish speaking counselors available in the community (Bai, Wunderlich & Fly, 2011). The U.S. Surgeon General's Call to Action address the need to increase training opportunities for racial and ethnic minority groups, as the IBCLC profession is lacking in minority representation (USDHHS, 2011). In addition, exploring the cultural acceptability of pumping as this can potentially increase exclusivity and breastfeeding duration for mothers who intend to provide breast and bottle feedings. Breastfeeding education for Hispanic mothers should include peers and family to increase support, as family ties are strong in the Hispanic culture as well as to provide education to dispel cultural myths (Bartick & Reyes, 2012). Further research should explore the value afforded to exclusive breastfeeding and identification of barriers that may be specific to Hispanic women at various levels of acculturation, as this may affect the resources available to them and how they cope. This should be done locally to address pertinent and real concerns that mothers report and that are specific to the mix of Hispanic community served. This information can be used to develop interventions that are culturally acceptable and promote

increasing the practice of exclusive breastfeeding or use of exclusive human milk for the local Hispanic community served.

Assumptions and Limitations

The investigator stopped measuring breastfeeding duration at 6 weeks postpartum and no data beyond that time, is available, even though many healthcare organizations recommend exclusive breastfeeding for at least 6 months postpartum (AAP, 2012). Currently a validated tool for measurement of exclusive breastfeeding does not exist and use of the Index of breastfeeding was useful as a guide for questioning and to inquire further regarding breastfeeding practices. Recommendations exist for the use of a standardized measurement for breastfeeding practices and to improve the interpretation of study findings (Hector, 2011). The use of the breastfeeding index provides data that is ordinal in level and this can be limiting for analysis. Yet further information on intensity or dose of breastfeeding and the unique breastfeeding practices of this Hispanic sample were provided with use of the breastfeeding index. This information can then be used to guide development of interventions and improve breastfeeding practices. This data will be relevant only to the Mexican country of origin sample and not all Hispanic groups or other ethnic or cultural groups. Unequal sample sizes and limited sample size prevented use of structured equation modeling, program LISREL for further analysis of the proposed model and more importantly assessment of measurement error of the construct acculturation.

In addition the PI is currently employed as a lactation consultant at TGH and this does represent a bias. The hospital where the study took place did not have designated Baby Friendly Hospital status but did have a breastfeeding policy in place for more than 15 years. During the six month recruitment period the PI worked assisting mothers who needed lactation support and tracking of which study participants were assisted or not was not documented. A bilingual and

bicultural research assistant assisted the PI with consenting and data collections. Recruitment occurred during non-working hours and patients were assured that participation was only voluntary and did not influence care received at the postpartum unit.

Implications for Public Health

The concept of acculturation has been studied in various disciplines and is reaching almost a century of work and progress, yet it is still critiqued for its lack of agreement over definitions, lack of consistency with measurement scales and conflicting outcomes in studies (Rudmin, 2009). This study compared the measurement of biculturalism using two distinct tools on the same sample. Women who were identified as bicultural using the BAS tool were classified as More Hispanic by the ARSMA LAS categories. The tools only agreed on one participant as being bicultural as measured by both tools. This can lead to varying outcomes and maybe the reason why only the scores on the BAS non-Hispanic domain subscale were significantly different for those breastfeeding and not the ARSMA non-Hispanic subscale or linear acculturation measure scores. Measuring acculturation and interpreting its effect on health behaviors is a difficult task as culture is dynamic and requires new innovative methods to assess these changes. The reality of the globalized world and the advances in communication of the 21st century provide ample opportunities for interaction and change to occur even in the native country of origin and urban cities are prime settings for marketing and have increased economic opportunities compared to rural communities (Himmelgreen, Cantor, Arias & Romero Daza, 2014). After settlement these interactions persist and can affect decision making, health behaviors and even significance afforded to cultural values. Himmelgreen and colleagues suggest the use of the Ecological Model of Food and Nutrition and the Critical Biocultural Perspective to

use as theoretical frameworks for not only studying dietary changes but for health disparities as well (Himmelgreen et al., 2014). Research that investigates Hispanic mother's reasons for infant feeding decision making while providing further description of the specific context involved can provide a deeper understanding of cultural influences and pertinent information that can be useful to improve clinical practice and ultimately health outcomes.

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Appendix A IRB Approval Letter

USF
UNIVERSITY OF
SOUTH FLORIDA

DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
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May 18, 2011

Ivonne Hernandez
College of Nursing

RE: **Expedited Approval** for Initial Review
IRB#: Pro00002943
Title: Acculturation, Self-Efficacy and Breastfeeding Behavior in a Sample of Hispanic Women

Dear Ivonne Hernandez:

On 5/17/2011 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol**.** Please note that your approval for this study will expire on 5-17-12.

Approved Items:
Protocol Document(s):

Acculturation, Self-Efficacy and Breastfeeding Behavior	5/3/2011 12:06 PM	0.02

Consent/Assent Documents:

Name	Modified	Version
Adult IC English .pdf	5/18/2011 8:30 AM	0.01
Adult Spanish Consent.pdf	5/18/2011 8:30 AM	0.01

Waiver of Consent for chart reviews.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review

research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

Your study qualifies for a waiver of the requirements for informed consent (for chart reviews) as outlined in the federal regulations at 45CFR46.116 (d) which states that an IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent, or waive the requirements to obtain informed consent provided the IRB finds and documents that (1) the research involves no more than minimal risk to the subjects; (2) the waiver or alteration will not adversely affect the rights and welfare of the subjects; (3) the research could not practicably be carried out without the waiver or alteration; and (4) whenever appropriate, the subjects will be provided with additional pertinent information after participation.

Your study qualifies for a waiver of the requirement for signed authorization as outlined in the HIPAA Privacy Rule regulations at 45 CFR 164.512(i) which states that an IRB may approve a waiver or alteration of the authorization requirement provided that the following criteria are met (1) the PHI use or disclosure involves no more than a minimal risk to the privacy of individuals; (2) the research could not practicably be conducted without the requested waiver or alteration; and (3) the research could not practicably be conducted without access to and use of the PHI. (per V. Witanachchi, "A Waiver of HIPAA Authorization has been approved for you to review medical charts for screening purposes, of those patients admitted to the Tampa General Hospital involving patients of self identification with country of origin from Mexico, Cuba or Puerto Rico, who intend to breastfeed partially or exclusively, who has the ability to read and write in English or Spanish, and who is within the ages of 18-45 with a singleton birth. Eligible and willing participants will be recruited upon obtaning consents and authorizations.")

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have

any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, PhD, Chairperson
USF Institutional Review Board

Cc: Various Menzel, CCRP
USF IRB Professional Staff

Appendix B

Study Protocol

1. PI Ivonne Hernandez RN MS IBCLC
2. RA (TBD) to assist with data collection at TGH
3. Study flyers will be displayed at clinics where women who give birth at TGH receive care.
4. Prescreening will be done by examining the medical chart prior to approaching the subject on the postpartum floor at TGH to check for exclusion criteria. Study exclusion criteria consist of any one of the following:
   a. Maternal HIV infection
   b. Mothers who have active untreated tuberculosis disease or are human T-cell lymphotropic virus type I–or II–positive.
   c. Mothers who are receiving diagnostic or therapeutic radioactive isotopes or have had exposure to radioactive materials (for as long as there is radioactivity in the milk.).
   d. Mothers who are receiving antimetabolites or chemotherapeutic agents.
   e. Mothers who are using drugs of abuse ("street drugs");
   f. Infant diagnosis of galactosemia
   g. Infant born with major congenital defects or syndrome (Cleft lip, Cleft Palate, Trisomy 21) that may impede breastfeeding.
   h. Gestational age less than 37 weeks
   i. Cesarean birth
   j. Multiple Twin gestation
   k. Neonatal intensive care unit admission.
5. Potential subjects will be approached at the TGH postpartum floor (4H) and the study will be described. If participant is interested then the prescreening sheet with self identification of country of origin and breastfeeding intention will be administrated. If subject qualifies by selecting country of origin Mexico, Cuba or Puerto Rico and intending to breastfeed then informed consent will be administered.
6. After informed consent is administered then study surveys will be administered. All subjects will be at least 24 hours postpartum prior to completing the study surveys. Approximately 35-45 minutes will be needed for surveys to be completed by subject. Study subjects will complete a demographic tool and study surveys. An investigator tool will be completed using the medical chart.
7. After study surveys are administered and completed then a ten dollar Wal-Mart gift card will be provided to compensate for subjects time.
8. A follow up phone call will be done at 6 weeks postpartum. Type of infant feeding and employment status will be assessed. For mothers who have stopped breastfeeding timing of last breastfeeding or intake of breast milk will be documented as well as reason for termination of breastfeeding. Approximately 10 minutes is expected for follow up call. If a breastfeeding problem or maternal or infant condition arises health care provider will be contacted and referral to community resources will be provided.

Appendix C

Study Flyer

Acculturation, Self-efficacy and Breastfeeding Behavior in a sample of Hispanic Women

(Pro 00002943)

Are you having your baby at Tampa General?

The purpose of this research study, **Acculturation, Self-efficacy and Breastfeeding Behavior in a sample of Hispanic women** is to learn more about the breastfeeding practices of Hispanic women. We will collect information on how you are feeding your infant, how you are adapting to American Culture, how self-confident you feel, and how much social support you feel you have. A $10 Wal-mart gift card will be provided for your time.

If you are giving birth at Tampa General Hospital you may qualify to participate in the research study if:

- **You intend to breastfeed your baby, and**
- **Are of Mexican, Cuban or Puerto Rican origin.**

Any questions call

Principal Investigator: Ivonne Hernandez RN MS IBCLC

813 323 7452

THANK YOU!!!!!!!

Aculturación, Auto -Eficacia y comportamiento de la lactancia materna en un grupo de mujeres Hispanas (Pro 00002943)

Usted va a tener su bebe en Tampa General?

El propósito de este estudio de investigación, **Aculturación, Auto -Eficacia y comportamiento de la lactancia materna en un grupo de mujeres Hispanas,** es aprender mas de las prácticas de la lactancia materna de las mujeres Hispanas. Estaremos colectando información sobre cómo esta alimentando a su bebe, y la forma en que se adaptan a la cultura Americana, colectaremos información sobre que confidente en si mismo usted se siente y cuanto suporté social usted siente que tiene. Una tarjeta de regalo de $10 de Wal-Mart se va a dar para compensar su tiempo en el estudio.

Si usted va a dar a luz en el Hospital de Tampa General usted puede cualificar para participar en el estudio de investigación si:

- Usted tiene intención de amamantar (dar pecho) a su bebe, y
- Es de origine Mexicano, Cubano o Puertorriqueño.

Cualquier pregunta llame a 813 323 7452

Investigadora Principal: Ivonne Hernandez RN MS IBCLC

GRACIAS!!!!!!!!!!

Appendix D Screening Tool and Survey

Screening Tool

******Will be administered by Research Assistant as a screening for meeting inclusion criteria.

There is no right or wrong answer

1. Are you of Hispanic, Latino or Spanish origin?
    a. No
    b. Yes

2. With what Hispanic, Latino or Spanish country of origin do you self identify?
    a. Mexico
    b. Puerto Rico
    c. Cuba
    d. Another country. **Print country for example** Argentina, Colombia, Dominican Republic, Nicaragua, Salvador, Spain etc

    _____

3. Do you intend to provide breast milk or breastfeed this infant?
    a. Yes
    b. No

Subject ID _____

Demographic Tool

Please fill out the questions below by circling your response or filling in your response as needed. There is no right or wrong answer.

1. Name _____
2. Phone number _____
3. Age_____
4. Where were you born? _____
5. If born out of the U.S. at what age did you come to the U.S.? _____
6. Where were your parents born? _____
7. With what Hispanic, Latino or Spanish origin do you self identify?
    a. Mexican
    b. Mexican-American
    c. Chicano
    d. Puerto Rican
    e. Cuban
    f. Cuban-American
    g. Another Hispanic, Latino or Spanish Origin. **Print origin for example** Argentinean, Colombian, Dominican, Nicaraguan, Salvadorian, etc _____
8. What is your Race/Ethnicity?
    - o Caucasian
    - o African-American
    - o Asian/Pacific Islander
    - o Native American
    - o Other
9. What is your highest level of education completed?
    a. Grammar School
    b. Middle School

c. High School Graduate
d. College Graduate
e. Post Graduate Study

10. In what country did this education occur? _____

11. What is your annual household Income (Yearly):

a. Under $4,999
b. $5,000-14,999
c. $15,000-24,999
d. $25,000-39,999
e. $40,000-69,999
f. $70,000+

12. What is your marital status?

a. Single
b. Married
c. Divorced
d. Widowed

13. Are you currently working?

a. Not working

b. Full time _____

c. Part time _____

d. If so what type of work _____

14. Do you intend to return to work postpartum?

a. No

b. Full time _____

c. Part time_____

d. If so what type of work _____

15. What is your Height? _____

16. What is your weight prior to this pregnancy? _____

17. How much weight did you gain during this pregnancy?_____

18. Did you receive prenatal care? a. No b. Yes

19. Are you currently receiving any medical treatment for any health problems? If so please list. No

o Yes, please list

Health Problems Continued:

1.
2.
3.
4.

20. Date of baby's birth _____ baby's weight_____

21. Any difficulties or complications with delivery?

a. No

b. Yes _____

22. Do you smoke? a. No b. Yes

23. Are you enrolled in WIC? a. No b. Yes

24. Did you attend a breastfeeding class? a. No b. Yes which one? _____

25. How many children do you have? _____

26. Have you previously breastfeed? a. No b. Yes if so for how long? _____

27. Have you been provided with any advice on breastfeeding during this pregnancy?

a. No b. Yes by whom? _____

My doctor Nurse Mother Husband/Partner Friend Mother in-law other _____

28. Does your mother live in the U.S.? No Yes

29. Where you breastfeed as a child? No Yes

30. Have you received help with breastfeeding in the hospital? No Yes

If Yes who has helped you with breastfeeding while you were at Tampa General Hospital?

_____
_____
_____
_____

31. At this time are you having problems latching your baby to your breast?

No Yes

32. How is your current infant breastfeeding?

a. Exclusively breastfeeding (Only Breast milk) Why

b. Partial Breastfeeding (Breast milk and Formula) Why

c. No breastfeeding (Formula only) Why

_____
_____
_____
_____
_____
_____

Research Assistant/PI will utilize the Index below to quantify Breastfeeding Behavior

Index of Breastfeeding: Measurement of Intensity of Breastfeeding Behavior

Value	Breastfeeding Behavior	Intensity	Category
6	Exclusive	No other liquid or solid is given infant except breast milk	Full
5	Almost Exclusive	Vitamins, water juice or ritualistic feeds given to infant in addition to breast milk	
4	Partial High	> 80% Feeds are breast milk	Partial
3	Partial Medium	20-80% Feeds are breast milk	
2	Partial Low	<20% Feeds are breast milk	
1	Token	Minimal occasional irregular breastfeeds	Token
0	Not Breastfeeding at all	None	Weaned

CHART

Feeding designation chart_____ Gravidity Para _____
1st feeding of life _____ Infant Gestation_____

Skin to skin_____ Infant sex _____

Apgars_____ Infant weight_____

Medical indication for supplementation_____

Preguntas de Criterio

******Will be administered by Research Assistant as a screening for meeting inclusion criteria.

No hay respuesta correcta o incorrecta

1. Eres de origen Hispano, Latino o Español?
    a. No
    b. Si

2. Con que país de origen Hispano, Latino o Español se identifica usted?
    a. México
    b. Puerto Rico
    c. Cuba
    d. Otro país Hispano, Latino o Español.

    Escribe el país por ejemplo Argentina, Colombia, República Dominicana, Nicaragua, Salvador, España etc.

    _____

3. Tiene usted la intención de dar pecho (amamantar) o dar leche materna a su bebe?
    a. Si
    b. No

Subject ID _____

Información Demographica

Por Favor de llenar las preguntas siguientes circulando su respuesta o llenado su respuesta donde se necesaria. No hay una respuesta correcta o incorrecta.

33. Nombre _____

34. Número de teléfono _____

35. Edad _____

36. Adonde usted nació? _____

37. Si nació fuera de los Estados Unidos a que edad usted llego a los Estados Unidos? _____

38. Adonde nacieron sus padres? _____

39. Con que origen Hispano, Latino o Español se identifica usted?

    a. Mexicana,

    b. Mexicana-Americana,

    c. Chicana

    d. Puertorriqueña

    e. Cubano

    f. Cubano-Americano

    g. Otro origen hispano, Latino o Español.

        Escribe el origen por ejemplo Argentina, Colombiana, Dominicana, Nicaragüense, Salvadoreña, Española etc._____

40. Cuál es su Raza/Etnicidad :

- o Blanco (Anglosajón)
- o Áfrico-Americano
- o Asiático/ Islas Pacificas
- o Nativo Americano
- o Otro_____

41. Cuál es el nivel de educación más alta que hay completado?

    a. Escuela Elemental

    b. Escuela Intermedia
    c. Escuela Superior
    d. Bachillerato
    e. Maestría / Doctorado

42. En qué país completo esta educación? _____

43. Que es su **i**ngresos familiar (Anual):
    a. Menos de $4,999
    b. $5,000-14,999
    c. $15,000-24,999
    d. $25,000-39,999
    e. $40,000-69,999
    f. $70,000+

44. Que es su estado civil?
    a. Soltera
    b. Casada
    c. Divorciada
    d. Viuda

45. Esta usted trabajando actualmente?
    a. No Trabajo
    b. Medio tiempo
    c. Tiempo completo
    d. Tipo de trabajo:_____

46. Usted tiene intención de trabajar postparto?

    a. No Trabajo
    b. Miedo Tiempo
    c. Tiempo completo
    d. Tipo de trabajo:_____

47. Cuál es su altura? _____

48. Cuál fue su peso antes del embarazo?_____
49. Cuanto peso usted aumento durante este embarazo? _____

50. Usted recibo cuidado prenatal?
    a. No b. Si

51. Esta usted recibiendo en este momento algún tratamiento médico por algún problema de salud? Si es así por favor explique:
    - o No
    - o Si, Favor mencionar :

1.
2.
3.
4.

52. Fecha del nacimiento del bebe _____ Peso del bebe _____

53. Alguna dificultad o complicación durante el parto?

    a. No

    b. Si Cual fue? _____

54. Usted Fuma? a. No b. Si

55. Usted tiene el programa WIC? a. No b. Si

56. Usted fue a una clase de dar pecho (amamantar)? a. No b. Si donde fue_____

57. Cuantos niños tiene usted? _____

58. Usted ha dado pecho (amamantar) antes? a. No b. Si Cuanto tiempo _____

59. Hay recibido consejos sobre el dar pecho (amamantar) durante este embarazo?

    a. No b. Si de quien?

Mi Doctor Enfermera Madre Esposo/Companero Amiga Suegra Otro_____

60. Su madre esta viviendo aquí en los Estados Unidos? No Si

61. Fue usted amamantado cuando era niño? No Si

62. Usted hay recibido ayuda con el dar pecho (amamantar) en el hospital? No Si

Quien le ayudo con el dar pecho (amamantar) en el hospital de Tampa General?

_____
_____
_____
_____

63. Ahora esta usted teniendo problemas en enganchar el bebe a su pecho?

No Si

64. Como está usted dando pecho (amamantando) a su bebe?

a. Exclusivamente pecho (Solamente Leche Materna) Porque
b. Parcialmente (Las Dos Cosas) (Leche Materna y Formula) Porque
c. Ahora no está dando leche materna (Solamente Formula) Porque

_____
_____
_____
_____
_____
_

****Research Assistant/PI will utilize the Index below to quantify Breastfeeding Behavior**

Index of Breastfeeding: Measurement of Intensity of Breastfeeding Behavior

Value	Breastfeeding Behavior	Intensity	Category
6	Exclusive	No other liquid or solid is given infant except breast milk	Full
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1	Token	Minimal occasional irregular breastfeeds	Token
0	Not Breastfeeding at all	None	Weaned

CHART

Feeding designation chart_____ Gravidity Para _____

1st feeding of life _____ Infant Gestation_____

Skin to skin_____ Infant sex _____

Apgars_____ Infant weight_____

Medical indication for supplementation_____

Appendix E: Follow-Up Phone Call Script

***Will be completed by PI/RA via a telephone call.**

1. Will occur at 6 weeks postpartum
2. Introduction Hello my name is _____ . I am calling you to follow up on the Acculturation, Self-Efficacy and Breastfeeding Behavior in a sample of Hispanic women research study.
3. I will be asking about how your infant is feeding and your work status it will take about 10 minutes. Is this a good time to do this?
    a. If so thank you.
    b. If not when I can give you a call back?
4. How is your newborn infant feeding?

Table 1. Index of Breastfeeding: Measurement of Intensity of Breastfeeding Behavior

Value	Breastfeeding Behavior	Intensity	Category
6	Exclusive	No other liquid or solid is given infant except breast milk	Full
5	Almost Exclusive	Vitamins, water juice or ritualistic feeds given to infant in addition to breast milk	
4	Partial High	> 80% Feeds are breast milk	Partial
3	Partial Medium	20-80% Feeds are breast milk	
2	Partial Low	<20% Feeds are breast milk	
1	Token	Minimal occasional irregular breastfeeds	Token

0	Not Breastfeeding at all	None	Weaned

5. If stopped breastfeeding
    a. When did infant last receive breast milk? _____
    b. Why did you stop breastfeeding (providing breast milk)
        i. Pain with latch
        ii. Sore nipples
        iii. Infant not wanting to latching
        iv. Low milk supply
        v. Infant not satisfied at breast
        vi. Maternal Health issues _____
        vii. Infant Health issues _____
        viii. Returning to work
        ix. Other _____

6. Are you currently working?
    a. No
    b. Yes*
        i. Full time _____
        ii. Part time _____
        iii. Type of work _____

7. If a breastfeeding problem or maternal or infant condition arises health care provider will be contacted and referral to community resources will be provided.
    a. TGH Warm line 813 844-7613
    b. La Leche League 813 774-9709
    c. Baby Café Alex Boyer 813 223-2800
    d. WIC 813 307-8015 EXT 7471

8. Thank you for your time and participation in this research study. This study has now finished and we will not be contacting you again.