

**THE HISPANIC PARADOX
AND BREASTFEEDING:
DOES ACCULTURATION MATTER?
EVIDENCE FROM THE
FRAGILE FAMILIES STUDY**

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The Hispanic Paradox and Breastfeeding: Does Acculturation Matter? Evidence from the Fragile Families Study

Abstract: This paper uses data from the Fragile Families and Child Wellbeing Study to test the hypotheses that (1) the Hispanic paradox extends to breastfeeding and (2) acculturation accounts for part of the paradox. The results support both hypotheses. Mexicans are just as likely to breastfeed as native whites, despite lower SES levels, which provides support for an Hispanic paradox for breastfeeding behavior. In fact, after accounting for background characteristics affecting the propensity to breastfeed, Mexicans are much more likely than whites to breastfeed. Using a new acculturation scale developed for this paper, we find that levels of acculturation account for the differences in breastfeeding between Mexicans and whites. The results suggest that low levels of acculturation operate to protect Mexican immigrants from choosing to formula-feed, which gives their babies many health advantages, and may be associated with better health outcomes across the life course.

INTRODUCTION

The “Hispanic Paradox” – the fact that Hispanics, especially recent immigrants, have remarkably good health outcomes given their low socioeconomic status and other classic risk factors – has emerged as an important topic among researchers interested in racial and ethnic disparities in health and health behaviors. Close investigation of the paradox reveals intra-ethnic group differences based on country of origin. Mexicans tend to have the best health outcomes, when compared to Puerto Ricans or other Hispanic immigrants. The pattern of effects extends to low birth weight, infant mortality, and adult mortality (Hummer et al 1999; Landale, Opopesa, and Gorman, 1999; Scribner and Dwyer, 1989; Collins and Shay, 1994).

Breastfeeding is a health behavior that could evidence a Hispanic paradox. The U.S. Department of Health and Human Services reports that in 1998, 68% of whites breastfed, as compared to 66% of Hispanics and 45% of blacks (Healthy People 2010). Because Hispanics are breastfeeding at rates very near those of whites, despite very disparate socioeconomic levels, this indicates the presence of the Hispanic paradox. Because breastfeeding provides a number of important benefits to infants, it may form the basis for the existence of the paradox across the life course. Breastfed children are less likely to suffer from ear infections, bronchitis, meningitis, allergies, or problems with vomiting or diarrhea. Breastfeeding may even protect against Sudden Infant Death Syndrome (SIDS). Breastfeeding also benefits the mother—it can help burn calories, it builds bone strength, protects against certain types of cancers, speeds the contraction of the uterus to its pre-pregnancy size, and delays the return of the menstrual period (American Academy of Pediatrics, 2002). Breastfed babies may even develop higher IQs (Anderson, Johnstone, and Remley, 1999). Breastfeeding also has a large effect on infant

mortality. Infants who are breastfed are 80 % less likely to die before the age of one than never-breastfed infants (Forste, Weiss, and Lippincott, 2001).

While a recent increase in US breastfeeding rates has been noted (CDC, 1995), the rates still fall short of the Healthy People 2010 goal of 75 %. When only socio-economically disadvantaged women are studied, rates are much lower (Guttman and Zimmerman, 2000; Stranahan 1988; Humphreys, Thompson, and Miner, 1998). In the United States, higher rates of breastfeeding are associated with education, age, and urban residence (Ross Products Division, 2000; Ford and Labbock 1990; Humphreys, Thompson, and Miner, 1998). Given the racial, ethnic and SES disparities, coupled with the enormous benefits gained from the practice of breastfeeding, studying the determinants of breastfeeding is of paramount importance not only to public health researchers but also to sociologists who are interested in inequality and differences in life chances.

In this paper, we use data from the Fragile Families and Child Wellbeing Study to test two hypotheses: (1) that the Hispanic paradox extends to breastfeeding and (2) that low acculturation to American society accounts for the paradox.

BACKGROUND

The Hispanic Paradox

The Hispanic paradox was first observed and discussed by Teller and Clyburn in 1974 (Gutmann et al, 1998). In the late 1980s, interest in the paradox was revived. While several health outcomes have been examined for evidence of an epidemiological paradox, including adult mortality (Hummer et al, 2000; Rosenwaike, 1987) and adult health status (Markides et al, 1997; Guendelman and Abrams, 1995), most of the literature addresses low birthweight and infant mortality (Landale, Oropesa, and Gorman, 2000; Cobas et al, 1996; Hummer, Eberstein and Nam, 1992; Becerra, 1991; Forbes and Frisbie, 1991;

Scribner, 1991; Rogers, 1989; Williams, Binkin and Clingman, 1986; Scribner and Dwyer, 1989).

Most of the focus in the literature has been on Mexican Americans, partly because of the size of the Mexican population in the US, and partly because this population consistently evidences good birth outcomes. Instead of the expected finding that Mexicans have birth outcomes similar to those of non-Hispanic blacks (because of their low socioeconomic status), studies show that Mexicans have birth outcomes that are similar to those of non-Hispanic whites (Guendelman 1995; Scribner and Dwyer, 1989). Once this finding was established, researchers began to look closer and discovered that Mexican immigrants had better birth outcomes than US-born Mexicans (Collins and Shay, 1994; Scribner and Dwyer, 1989). The latter finding suggested that something about Mexican culture may promote good birth outcomes, and that living in the US is somehow deleterious to this culture.. Several studies tested the “cultural protection hypothesis,” and found that low levels of acculturation are associated with healthier pregnancy behaviors and birth outcomes (Sherraden and Barerra, 1997; Sherman, 1993; Balcazar, Peterson and Cobas, 1996; English, Kharrazi, and Guendelman, 1997; Cobas et al, 1996; Balcazar and Krull, 1999; Landale, Oprea, and Gorman, 2000).

Critiques of the Hispanic Paradox

The Hispanic paradox thesis is not without its detractors. Perhaps the most salient critique is the “healthy migrant” hypothesis, which posits that Hispanic migrants have relatively good health outcomes because only the healthiest can persevere through the often arduous journey and disadvantaged circumstances awaiting them in the US. This selectivity then provides a misleading view of the overall health of Hispanics. For this criticism to hold, non-migrant Mexicans should exhibit lower average health levels than Mexican immigrants. However, such a pattern is not found with breastfeeding rates. In a

recent Mexican study of births at a public hospital (where 85% of Mexican births take place), 92 % of women breastfed their babies (Langer et al, 1998). The Demographic Health Study of 1987 found 83.2 % of Mexican infants were breastfed. Similarly, the World Fertility Survey of 1976 showed that 80.9 % of Mexican infants were breastfed (Trussell et al, 1992). While these estimates may not give an exact estimate of breastfeeding prevalence in Mexico, clearly the rates there are higher than those provided by the Department of Health and Human Services for the US which are around 64 % for all women, with significantly lower rates for some minority groups (Healthy People 2010).

Another critique of the Hispanic paradox research is that of insufficiently defined target groups (Palloni and Morenoff, 2001). Many studies rely on Hispanic surnames to determine ethnicity. In some cases the researchers cannot specify the immigration status of their Hispanic respondents, and therefore mix foreign-born and native-born Hispanics. Our data allow us not only to identify the immigrant generation and country of origin for new mothers but also to measure their self-identified ethnicity. This information allows us to distinguish between Mexican immigrants and Mexican-Americans (second generation and third generation or higher).

The Theory of Acculturation

The classical definition of acculturation derives from anthropology. Redfield, Linton, and Herskovitz (1936) state that “acculturation comprehends those phenomena which result in groups of individuals having different cultures coming into continuous first-hand contact, with subsequent changes in the original culture pattern of either or both groups.” All immigrants to the US experience a process of acculturation. The question is: How much of US culture is transferred to the immigrants? To what extent is there reciprocity? Do some immigrants assimilate quickly while others adapt more

slowly, or do all immigrants assimilate at roughly the same rate? The part of acculturation in which Hispanic paradox researchers are interested involves health behaviors. Is there something about *low* levels of acculturation that is beneficial to Mexican immigrants in terms of health? Put another way, is there something about American culture that is harmful to health behaviors?

American culture could discourage breastfeeding because of high rates of female labor force participation, and because of technological advancements, of which baby formula is a part. Breastfeeding in America is often perceived as embarrassing and difficult, particularly among minorities or poor women (Guttman and Zimmerman, 2000). Many women may experience difficulties with breastfeeding because of poor education about the practice, and, in a few instances, genuine physical problems (Maclean, 1988; Hannon 2000; Schmied and Lupton, 2001). In one study, 83 % of black women said that they preferred to formula-feed (Forste, Weiss, and Lippincott, 2001). Because Mexican immigrants often live in low SES neighborhoods with or near African-Americans, we might expect the cultural preference for bottle-feeding to transfer from one culture to another.

Over the past decade, researchers have paid increasing attention to the connection between the level of acculturation of immigrants and health outcomes. Acculturation into American society is expected to have a negative effect on health because it involves a loss of traditional practices and/or attitudes that serve to promote positive health behaviors. In one study, Mexican immigrants with low levels of acculturation were found to have fewer low birth weight babies than other women. The authors attributed this finding to the fact that the immigrant women practiced good daily pregnancy care because of traditional Mexican healthcare customs (Sherraden and Barrera, 1997).

Negative acculturation describes the process by which immigrants are exposed to negative aspects of American culture, such as poor diet, and crowded, poor

neighborhoods, which can have a deleterious effect on positive health behaviors. Portes and Rumbaut (2001) argue that the outcome of assimilation varies by type of ethnic group and describe the process by which negative assimilation occurs. According to their argument, if an immigrant group enters the US working class as part of a strong ethnic community, acculturation to mainstream culture will likely occur. If, however, immigrants do not have the benefit of a strong ethnic community, downward or 'negative' assimilation to the native ethnic class can occur. Portes and Rumbaut found strong evidence that negative assimilation is widespread among second-generation Mexicans, in terms of language skills, educational aspirations and achievement, income, and attitudes (2001). An example of health-related negative acculturation is the fact that Mexican female immigrants of childbearing age are more likely than US-born Mexicans to have an adequate daily intake of protein, calcium, and several vitamins, possibly leading to better health (Guendelman and Abrams, 1995). Second-generation Mexican-Americans have diets very similar to US-born non-Hispanic white women. Therefore, the immigrants' initial *lack* of acculturation serves to minimize the likelihood of negative health behaviors common among the host population.

Acculturation, Breastfeeding, and the Hispanic Paradox

Hispanics in the US typically have lower educational attainment (CPS 2000) and higher poverty rates than non-Hispanic whites (Census 2000). They have similar poverty rates and lower educational attainment than non-Hispanic blacks. The fact that Hispanics consistently show rates of breastfeeding similar to non-Hispanic whites and higher than non-Hispanic blacks is puzzling given these and other demographic characteristics (Centers for Disease Control). If the differences between Hispanics and others could be explained by socioeconomic status, we should observe similar levels of breastfeeding for blacks and Hispanics, and higher rates of breastfeeding for whites than for Hispanics.

Acculturation could explain this differential. Because the rates of breastfeeding in Mexico are so high, it is possible that immigrants from Mexico are carrying-over breastfeeding behavior, much as they do other health practices, to the US, regardless of US cultural influences. However, as acculturation occurs, second and subsequent generations may abandon breastfeeding in favor of the more “Americanized” practice of bottle-feeding. One small, qualitative study found that Mexican women who choose to breastfeed hold more traditional values than Mexican women who do not breastfeed (de la Torre and Rush, 1987). Another found that Mexican immigrant women were more likely to breastfeed than Mexican-American women (Romero-Gwynn and Carias, 1989), although Balcazar et al found no effects of immigrant status (1995). John and Martorell found that use of the Spanish language was a predictor of breastfeeding among Mexican-American women (1989).

The relationship between SES and breastfeeding in the US is not linear. Highly educated, high-income women breastfeed at much higher rates than less educated women. However, lower-educated, lower-income Mexican immigrants also breastfeed at very high rates. We suspect that low levels of acculturation for the Mexican immigrants could account for this curvilinear pattern. Mexican immigrants, who breastfeed at very high rates but have low SES may have low acculturation. Highly-educated US mothers are probably breastfeeding despite the negative aspects of US culture because they know about the health advantages of breastfeeding. In contrast, the less-educated immigrant mothers are breastfeeding because of traditional habits, not necessarily modern information. Therefore, American culture varies on breastfeeding, with well-educated women preferring to breastfeed because they recognize its health advantages. Lower-educated women choose to bottlefeed, either because they do not appreciate the health advantages of breastfeeding or because they view it as ‘lower class’ or inconvenient. It is to this latter group of U.S. mothers that recent immigrants may negatively assimilate.

We hypothesize that *the low levels of American acculturation experienced by Mexican immigrants serve to discourage formula-feeding, because low levels of acculturation indicate a probable adherence to traditional health practices* (Balcazar and Krull, 1999; Landale, Oropesa, and Gorman, 2000).

DATA, VARIABLES, AND METHODS

Data

Most breastfeeding studies are clinical or qualitative studies with small sample sizes. Even studies with large samples do not have sufficient numbers of minorities or immigrants to examine their behavior in relation to other groups. In this study we use data from the Fragile Families and Child Wellbeing Study, a new national survey that follows a birth cohort of new (mostly) unwed parents and their children over a four year period. The baseline interviews, conducted between 1998 and 2000, contains information on 3,712 births to unmarried parents and 1,188 births to married parents, in 20 large U.S. cities.¹ The survey over-sampled unmarried mothers and thus contains a large sample of minority and immigrant women. The data include information on the resources and relationships of new parents and their effects on children. The mothers' first interviews took place within 48 hours of the birth while they were still in the hospital. Fathers were interviewed either in the hospital or elsewhere, a short time later. Follow-up interviews were conducted at 12 months and 30 months, with another scheduled for 48 months. In addition to sociodemographic and attitudinal information for both mothers and fathers, the data contain information on whether or not children were ever breastfed, and for how long they were breastfed. For this paper, we use data from both the first and second wave

¹ The 20 cities are Oakland, CA; San Jose, CA; Jacksonville, FL; Chicago, IL; Indianapolis, IN; Boston, MA; Baltimore, MD; Detroit, MI; Newark, NJ; New York, NY; Toledo, OH; Philadelphia, PA; Pittsburgh, PA; Nashville, TN; Austin, TX; Corpus Christi, TX; San Antonio, TX; Norfolk, VA; Richmond, VA; and Milwaukee, WI.

on a total of 4368 mothers and children. Mothers with missing information on breastfeeding (n=34, .7%) were deleted from the sample. In order to reduce heterogeneity within the Hispanic and white categories, we limit our sample to those who self-identified as being of Mexican origin or as being white,² yielding a total analytic sample of 1,591 mothers, comprised of 937 whites and 654 Mexicans.

Variables

Our outcome variable is an indicator measuring whether a mother *breastfed* her child. Background variables include an indicator variable for whether the mother is *Mexican*, mother's *age*, *education*, and *income*, *parity*, and whether she is *married* or *cohabiting* with the baby's father. Age (measured as a continuous variable) is usually shown to be a factor in breastfeeding, with older women more likely to breastfeed (Roe et al, 1999; Peterson and DaVanzo, 1992; Humphreys, Thompson, and Miner, 1998). Older women tend to have more education and life experience, and so may be more likely to breastfeed. Income (measured in \$1,000 increments) and education (measured as a dummy variable for whether mother has a high school degree) also play a role in determining breastfeeding, possibly because women with more financial resources have more flexibility to adapt to breastfeeding. Women with more education might also better understand the benefits of breastfeeding than those with less (Roe et al, 1999; Humphreys, Thompson, and Miner, 1998; Stranahan, 1988). Women with only the one child (measured as a dummy variable) might be more likely to breastfeed, because they may Married and cohabiting women (measured as an indicator for whether the mother lives with the father of her child), may be more likely to breastfeed, because of the

² Additional analyses (not shown) which included only US born whites were also conducted, with virtually no change in the results: only 10% of the white subsample had parents born outside the US or themselves

additional support provided by their husband/partner (Humphreys, Thompson, and Miner, 1998; Maclean, 1988; Guttman and Zimmerman, 2000).

Our acculturation scale is adapted from the acculturation scale developed by Cuellar (1980; 1995) for Mexican Americans, and from the version used by the Hispanic Health and Nutrition Examination Survey (HHANES), (Scribner and Dwyer, 1989). We include several new measures in our scale, including religiosity and traditional views. Our acculturation scale (Cronbach's $\alpha=.65$) consists of seven measures, all coded so that a high value indicates *greater* acculturation. We include two variables concerning the level of cultural attachment, one variable indicating the extent of religious participation, the generation of the immigrant, two variables to capture traditional gender values, and an indicator for English language of interview. This language measure is recognized as an important component of an acculturation index (Castro, 1992). Cultural attachment is measured as the extent of agreement, (1) Strongly Agree to (4) Strongly Disagree, with two questions: (1) I feel an attachment towards my ethnic heritage and (2) I participate in cultural practices of my own group, such as special food, music, or customs. A higher score indicates more acculturation to mainstream American culture. Immigrants should score lower on this measure than non-immigrants, because they are likely to maintain a greater connection with their heritage than US natives. Religious participation is measured as frequency of church attendance, from (1) every week or more to (4) never. Immigrant generation takes four values: (1) foreign-born, (2) US born with both parents foreign-born, (3) US born with one parent foreign-born, and (4) US born and both parents US born. Traditional gender values are measured as the extent of agreement, (1) Strongly Agree to (4) Strongly Disagree, with two questions: (1) It is much better for everyone if the man earns the main living and the woman takes care of the home and family and (2) The important decisions in the family should be made by the man of the house.

Table 1 presents descriptive statistics for all variables used in the analysis by race (Mexican origin/white).

Methods

The analyses test two hypotheses: that the Hispanic paradox extends to breastfeeding, and that acculturation accounts for the Hispanic advantage in breastfeeding. We used logistic regression for the analyses, with models predicting whether the respondent breastfed her child during the first year of the child's life. Our first model includes only the indicator for Mexican origin. Our second model includes the background variables discussed above. Our third model includes the acculturation scale. Finally, we estimate separate models by race in an effort to determine whether the acculturation scale and background measures have similar effects on breastfeeding behavior for whites and persons of Mexican origin. We use these results to conduct several simulations in order to account for the paradox.

RESULTS

Table 1 presents the descriptive statistics for all variables in the analyses by ethnicity. As we would expect, Mexicans are, on average, younger and have significantly less education and less income than other mothers. Mexican mothers are also more likely to have other children than white mothers and a father is less likely to be present in a Mexican household, as compared with a white household.

In terms of the acculturation items, white mothers are more acculturated to American culture than Mexican mothers on every measure. Mexican mothers score lower on the cultural attachment questions (indicating *more* cultural attachment), and they are more likely to hold traditional views on gender roles. They score lower on religious participation (indicating a *higher* level of religiosity) and are, unsurprisingly, less likely

to have completed the interview in English. Furthermore, Mexican mothers are more likely to rank lower on the generation measure (indicating a greater propensity to be first or second generation immigrants). Mexican mothers also score significantly lower on the acculturation scale, indicating less acculturation. The only measure for which Mexican mothers and white mother appear similar is in breastfeeding behavior: Mexican women appear slightly more likely to breastfeed their child than white mothers, but the difference is not statistically significant.

Table 2 presents results of the sequence of nested logistic regression models described above. In the first model, only the Mexican indicator was included. In that model, the indicator variable, although positive, failed to reach significance. In the second model, the background variables were included. With the inclusion of these variables, Mexican mothers are significantly more likely to breastfeed than white mothers (OR=1.39), reflecting the Hispanic paradox. That is, if Mexican women were comparable on various background characteristics affecting the propensity to breastfeed, their rates would be considerably higher than whites. As it stands, given that Mexican women have less education and income, and perhaps more role strain (e.g., no father in the home to help with other tasks) than whites, they do not evidence significantly higher gross rates, reflecting a weaker form of the paradox (they are *not* significantly lower as we would expect).

Model 2 also shows that women who are older, have completed high school, live with the father of their child, and have only the one child have greater odds of breastfeeding. Having only the one child increases the odds of breastfeeding by 60 %. Living with the father of their baby increases the odds of breastfeeding by 46 %.

In model 3, we include the acculturation scale. The inclusion of this scale completely eliminates the effect of being Mexican, indicating that levels of acculturation explain the Hispanic paradox in breastfeeding. The log-odds coefficient for the scale

indicates that each one-point increase in acculturation is associated with a 13 % decrease in the odds of breastfeeding. After controlling for acculturation, the odds for high school education increase, indicating that low levels of education evidenced by our less-acculturated Mexican mothers were attenuating the effects of education on breastfeeding.

The models presented in Table 2 report the average effects of the covariates across all races. However, it is reasonable to assume that the effects of many of the covariates, especially the acculturation scale, may vary across whites and Mexicans. Indeed, it is unclear *what* the acculturation scale is measuring for non-immigrant whites. To address this problem, we ran two sets of models. The first set of models disaggregated the data by ethnicity to determine whether differential effects exist. The second set of models removes the generation and language of interview variables from the acculturation scale, because they are most likely correlated with our Mexican covariate (results shown in the Appendix). These results indicate that our scale is capturing acculturation even without generation or language of interview. After the inclusion of the acculturation scale, the Mexican coefficient is reduced by 52%, and loses its significance.

Table 3 presents results of a sequence of two models where we disaggregate the sample into whites and Mexicans. In the first model, only the background measures were included. Interestingly, but not surprisingly when considered within the Hispanic paradox framework, having a high school education is an extremely strong predictor of breastfeeding for white women, but not for Mexican women. Similarly, living with the child's father is an important predictor of breastfeeding for white women but not for Mexican women.

In the second model in Table 3, we included the background variables along with the acculturation scale. Interestingly, while acculturation is very important for predicting breastfeeding for Mexican women, as we would expect, it is also important for predicting

breastfeeding for white women, although to a lesser extent. To see whether our few white immigrants (40 first-generation and 58 second-generation) were driving these results, we ran the model excluding those respondents and obtained identical results. We also disaggregated the acculturation scale to see which components were driving the results for whites (not shown). Only one component of the acculturation scale, cultural participation, was significant after controlling for background variables. Clearly, there is something about a strong ethnic identity, manifested by cultural participation, that is important for breastfeeding for whites as well as Mexicans.

As a final attempt to explore the paradox, we conducted a simulation. Using the model for Mexican mothers only, we assigned white means to the Mexican coefficients and calculated predicted probabilities of breastfeeding, at varying levels of acculturation. This indicates the level of breastfeeding expected for Mexican mothers, given white mothers' characteristics, across different levels of acculturation. Because white mothers mostly score higher on the measures related to the propensity to breastfeed, and less-accultured mothers breastfeed more, at low levels of acculturation Mexican mothers have very high predicted probabilities of breastfeeding. Figure 1 shows the results of this simulation. As acculturation to U.S. society increases, the predicted probability of breastfeeding decreases for Mexican mothers. Around a score of 17 on acculturation, Mexican mothers and white mothers have equal probabilities of breastfeeding. Above a score of 16, Mexican mothers have lower probabilities of breastfeeding as compared to white mothers. This shows that acculturating to U.S. society has a detrimental effect on propensity to breastfeed for Mexican mothers.

DISCUSSION

This paper tests two hypotheses regarding the Hispanic paradox. First we test the hypothesis that the paradox extends to breastfeeding. We also test the hypothesis that

acculturation to mainstream society accounts for a substantial part of the Mexican paradox, using a new acculturation scale that incorporates attitudes and cultural attachment and participation. Our analyses support both hypotheses. Breastfeeding represents another example of the Hispanic paradox and the Hispanic paradox in breastfeeding can be explained by varying levels of acculturation. This paper presents strong evidence that health behaviors can vary by level of acculturation, indicating that increased time in the United States, and thus increased acculturation, could be detrimental to some health behaviors and health outcomes.

Our results that the propensity to breastfeed depends on acculturation supports the results of two small, qualitative studies (de la Torre and Rush, 1987; Romero-Gwynn and Carias, 1989). The covariates in this analysis all impact breastfeeding as expected, based on past studies. Having at least a high school degree increases the odds of breastfeeding, and the odds also increase as income increases. However, these results varied by ethnic group. A high school education is an important predictor for white mothers, but not Mexican mothers. This reflects the high propensity for breastfeeding among our immigrant Mexican mothers, despite their low levels of education. After controlling for acculturation, the effect of education for Mexican mothers goes from negative to positive, indicating that, net of acculturation effects, education is positively associated with breastfeeding for Mexican mothers. Income is not a good predictor of breastfeeding for Mexican mothers, although it is for whites. Living with the father of her child increases a mother's odds of breastfeeding by 43 %, although it is only important for white women. The positive effects of living with the father of the baby may be the result of having a partner available for support and encouragement, although it is unclear why this would not benefit Mexican mothers as well. Perhaps Mexican mothers get more of their support as it relates to breastfeeding from mothers or sisters, rather than partners. Each year of increasing age also increases the odds of breastfeeding, although this result was only

significant for Mexican women. Having only the one child increases the odds of breastfeeding for both white and Mexican mothers. The presence of an additional child in the family could leave the mother with less time to spend on her new baby, and more responsibilities to her other children, which could lead to a decision to formula-feed, which is often perceived as being easier than breastfeeding.

While we believe our findings are significant for further understanding the Hispanic paradox, our acculturation variables were somewhat limited. Also, we had limited data on breastfeeding. Information regarding whether the mother breastfed exclusively would help us obtain a better picture of the actual breastfeeding behavior in the sample. However, given the strength of our results, future studies of the Hispanic paradox should measure acculturation carefully and incorporate measures of both religiosity and traditional values.

In this paper, we attempted to determine whether the breastfeeding difference between Mexicans and whites is explained by differences in levels of acculturation, including language of interview, group identity, traditional views, and religiosity. After controlling for background variables, Mexicans have significantly greater odds of breastfeeding than whites, exemplifying the Hispanic paradox. Our results beg the question of whether breastfeeding could contribute to observed health advantages of Mexican Americans across the life course. Future research should attempt to tie breastfeeding to other health outcomes for Mexicans and other racial and ethnic groups. One often-proposed hypothesis to explain the Hispanic paradox is that low levels of acculturation serve to “protect” immigrants and second-generation Mexicans from some unhealthy aspects of American culture (Sherraden and Barrera, 1997; Balcazar and Krull, 1999; Landale, Oropesa, and Gorman, 2000). We find strong support for this hypothesis, as our acculturation scale eliminates the differences in breastfeeding between whites and Mexicans. More research is needed to understand the cultural transmission of health

behaviors and why the health behaviors of immigrants deteriorate over time in the United States.



APPENDIX. Results of Pooled-Sample Logistic Regression Analyses Predicting Breastfeeding: Acculturation Scale Minus Generation and Language of Interview (n=1,591)

<i>Variable</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
	<i>Coefficients(OR)</i>	<i>Coefficients(OR)</i>	<i>Coefficients(OR)</i>
Intercept	0.74***	-1.45***	.41***
Mexican	0.10(1.11)	0.48(1.62)***	.23(1.29)#
<u>Background</u>			
Age		0.05(1.05)***	0.04(1.04)**
High School		0.16(1.17)	0.22(1.25)#
Income (10,000s)		0.05(1.06)*	0.05(1.05)*
Only Kid		0.49(1.63)***	0.47(1.61)***
Father Lives In Home		0.42(1.51)**	0.38(1.47)**
<u>Acculturation</u>			
Acculturation Scale			-0.12(.89)***
Model chi-square(df)	0.92(1)	74.94(6)***	104.88(7)***

Note: Log-odds coefficients and odds ratios are presented in the table.

#p<.1, *p<.05, **p<.01, ***p<.001, two-tailed tests.

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Table 1. Descriptive Statistics for All Variables Used in the Analyses

<i>Variable</i>	<u>Whites (n=937)</u>		<u>Mexicans (n=654)</u>	
	<i>Mean or % (S.D.)</i>	<i>Range</i>	<i>Mean or % (S.D.)</i>	<i>Range</i>
Age	27.12(6.52)***	14-44	24.45(5.41)	15-44
High School Degree	82.1%***		42.8%	
Income (10,000s)	5.49(3.29)***	0-11	3.28(2.47)	0-11
Only Kid	45.8%***		38.6%	
Father Lives In Home	80.8%***		68.5%	
<i>Acculturation Scale Components (alpha=.65)</i>				
Cultural Participation	2.57(1.02)***	1-4	1.88(1.00)	1-4
Cultural Attachment	1.99(0.90)**	1-4	1.87(1.01)	1-4
Generation	3.76(.687)***	1-4	2.40(1.39)	1-4
Interview in English ³	99.6%***		60.5%	
Church Attendance	2.47(1.06)***	1-4	2.15(1.06)	1-4
Traditional Roles	2.89(.76)***	1-4	2.52(.84)	1-4
Man Makes Decisions	3.23(.70)***	1-4	2.89(.71)	1-4
Acculturation Scale	17.93(2.72)***	9-25	14.28(3.87)	6-24
<i>Dependent Variable</i>				
Ever breastfeed child?	67.8%		70.0%	

#p<.10, *p<.05, **p<.01, ***p<.001, two-tailed tests, denotes significant difference between whites and Mexicans.

³ In order to accommodate for the different scale of this variable, the indicator was also recoded as “0” or “4”, and the results do not differ.

Table 2. Results of Pooled-Sample Logistic Regression Analyses Predicting Breastfeeding (n=1,591)

<i>Variable</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
	<i>Coefficients(OR)</i>	<i>Coefficients(OR)</i>	<i>Coefficients(OR)</i>
Intercept	0.74***	-1.45***	1.59**
Mexican	0.10(1.11)	0.48(1.62)***	-0.003(.99)
<u>Background</u>			
Age		0.05(1.05)***	.027(1.03)*
High School		0.16(1.17)	0.33(1.39)*
Income (10,000s)		0.05(1.06)*	0.06(1.06)*
Only Kid		0.49(1.63)***	0.44(1.56)***
Father Lives In Home		0.42(1.51)**	0.36(1.43)**
<u>Acculturation</u>			
Acculturation Scale			-0.14(.87)***
Model chi-square(df)	0.92(1)	74.94(6)***	137.41(7)***

Note: Log-odds coefficients and odds ratios are presented in the table.

#p<.1, *p<.05, **p<.01, ***p<.001, two-tailed tests.

Table 3. Results of Logistic Regression Models of Breastfeeding by Race (White n=937, Mexican n=654)

<i>Variable</i>	Model 1		Model 2	
	<i>White</i>	<i>Mexican</i>	<i>White</i>	<i>Mexican</i>
	<i>Coefficients(OR)</i>		<i>Coefficients(OR)</i>	
Intercept	-1.66*	-0.45	.380	2.84***
<u>Background</u>				
Age	0.03(1.03)#	0.05(1.05)**	0.02(1.02)	0.01(1.01)
High School	0.66(1.94)**	-0.24(.78) (3)	0.68(1.97)***	0.08(1.09) (I)
Income (10,000s)	0.08(1.08)**	-0.007(.99)	0.08(1.07)**	-0.002(.99)
Only Kid	0.38(1.46)*	0.59(1.81)**	0.37(1.45)*	0.51(1.67)*
Father Lives In Home	0.72(2.04)***	0.11(1.12) (I)	0.66(1.93)***	0.04(1.04) (I)
<u>Acculturation</u>				
Acculturation Scale			-0.10(.90)***	-0.17(.84)*** (I)
Model chi-square	86.12(5)***	13.76(5)*	99.28(6)***	59.46(6)***

Note: Log-odds coefficients and odds ratios are presented in the table. Bold, italicized numbers in parentheses indicate level of significance of difference in coefficients between races (1=*, 2=**, 3=***). Formula used for this computation is: $t=(b_w-b_m)/\sqrt{SE(b_w)^2 + SE(b_m)^2}$. #p<.1, *p<.05, **p<.01, ***p<.001, two-tailed tests.

Figure 1: Predicted Probabilities of Breastfeeding, Assigning Mexicans White Means and Varying Acculturation



