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The Influence of Acculturation on Breastfeeding Initiation and Duration for Mexican-Americans

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Abstract

This paper uses data from the Fragile Families and Child Wellbeing Study to test the hypotheses that (1) Similar to other positive pre- and post-natal outcomes, Mexican immigrant mothers are more likely to breastfeed, and to breastfeed longer, than white or Mexican-American mothers; and (2) Acculturation accounts for the ethnic/nativity differential in breastfeeding initiation and duration. The results support both hypotheses. Mexican immigrants to the U.S. are much more likely than whites to breastfeed, and to breastfeed longer. Mexican-American mothers, after controlling for background characteristics, have similar initiation and duration to whites. Using expanded acculturation measures developed for this paper, acculturation accounts for some of the difference between whites and Mexican immigrants in breastfeeding initiation, and much of the difference for breastfeeding duration. 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. The results also suggest that successive generations of Mexican immigrants may abandon breastfeeding, which is deleterious for their infants.

Keywords

Acculturation; Breastfeeding; Mexican-Americans

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 – is a topic of interest 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, Cubans, and some Central Americans tend to have the best health outcomes when compared to other Hispanic immigrants. This pattern of effects extends to low birth weight, infant mortality, and adult mortality (Collins and Shay 1994; Hummer et al. 1999; Landale, Oropesa and Gorman 1999a; Scribner and Dwyer 1989).

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Breastfeeding is a health behavior that could also exhibit 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 (2000). Hispanics are breastfeeding at rates very near those of whites, despite quite disparate socioeconomic levels, which, given the strong association between SES and health, many researchers would consider to be paradoxical. Because breastfeeding provides a number of important benefits to infants, it could even form part of 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 2005). Breastfed babies may even develop higher IQs (Anderson, Johnstone and Remley 1999).

While a recent increase in U.S. breastfeeding rates has been noted (Centers for Disease Control 1995), the rates still fall short of the Healthy People 2010 goal of 75% of mothers initiating breastfeeding. For socio-economically disadvantaged women, rates are much lower (Guttman and Zimmerman 2000; Humphreys, Thompson and Miner 1998; Stranahan 1988). In the United States, higher rates of breastfeeding are associated with education, age, and urban residence (Ross Products Division 2001; Humphreys et al. 1998). Between 1990 and 2000, several groups of mothers have had large increases in the initiation of breastfeeding, suggesting that the public health campaign is having some effect. Black mothers' initiation rate went from 23 percent to 51 percent in the past decade, and teenaged mothers' initiation rate went from 30 percent to 56 percent (Ross Products Division 2001). These trends are encouraging, but when the focus of the investigation turns to breastfeeding *duration*, the numbers fall far short of public health goals. The American Academy of Pediatrics recommends a *minimum* of one year of breastfeeding. In 2000, only 17 percent of all mothers breastfed their babies for the recommended one year (Ross Products Division 2001). Given the racial, ethnic and SES disparities in initiation and duration, 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 health across the life course.

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), most of the literature addresses low birthweight and infant mortality (Becerra et al. 1991; Cobas et al. 1996; Forbes and Frisbie 1991; Hummer, Eberstein and Nam 1992; Landale, Oropesa and Gorman 2000; Rogers 1989; Rogers 1991; Scribner 1991; Scribner and Dwyer 1989; Williams, Binkin and Clingman 1986).

Most of the focus in the literature has been on Mexican Americans, partly because of the size of the Mexican population in the U.S., 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, English and Chavez 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 U.S.-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 U.S. 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 (Balcazar and Krull 1999; Balcazar, Peterson and Cobas 1996; Cobas et al. 1996; English, Kharrazi and Guendelman 1997; Landale et al. 2000; Sherman 1993; Sherraden and Barrera 1997).

Explanations for the Hispanic Paradox

Researchers of the Hispanic Paradox typically cite two main mechanisms by which Hispanics are thought to achieve better-than-expected health outcomes: Selection of healthy immigrants into and out of the U.S. and acculturation. The selection argument claims that since healthier people are more likely to immigrate to the U.S. than their less-healthy counterparts in Latin America or other sending countries, the foreign-born population in the U.S. may be healthier than persons born in the U.S. (Jasso et al. 2004; Landale et al. 2000; Palloni and Arias 2004; Sorlie et al. 1993). Additionally, because persons who are sick appear to be more likely to leave the U.S. to return to their home countries, these two phenomena combine to produce lower rates of morbidity and mortality for the Hispanic population in the U.S. (Abraido-Lanza et al. 1999; Pablos-Mendez 1994). For this argument to hold, Mexicans in Mexico 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, 92 % of women breastfed their babies (Langer et al. 1998). The Demographic Health Study of 1987 found that 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 up-to-date 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 U.S. which are around 64% for all women, with significantly lower rates for some minority groups (U.S. Department of Health and Human Services 2000).

Some scholars believe that low levels of acculturation to the U.S. may be a reason immigrants often have better health outcomes and behaviors than the second generation (Arcia et al. 2001; Frisbie, Cho and Hummer 2001; Garcia-Maas 1999; Gordon-Larsen et al. 2003). Deleterious changes in diet, exercise, and other health behaviors may cause the health of an immigrant to decline over time and also influence their children, the second generation. Neither of these explanations can be explicitly ruled out with current data, and it is safe to assume that both are operating to some extent to produce health advantages for Hispanic immigrants. Recent papers have found evidence for both selection and acculturation occurring simultaneously, and thus the two explanations are seen as complementary rather than competing (Frisbie et al. 2001; Landale et al. 2000).

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 U.S. experience a process of acculturation. The question is: How much of U.S. 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? 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 (Hannon et al. 2000; Maclean 1988; 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, one might expect the 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 to 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). An example of health-related negative acculturation is that, for women, U.S.-born Mexicans of childbearing age are less likely than Mexican immigrants to have an adequate daily intake of protein, calcium, and several vitamins, possibly leading to worse health (Guendelman and Abrams 1995). Second-generation Mexican-Americans have diets very similar to U.S.-born non-Hispanic white women. Therefore, the immigrants' initial *lack* of acculturation serves to minimize the likelihood of negative health behaviors common among the second generation.

Acculturation, Breastfeeding, and the Hispanic Paradox

Hispanics in the U.S. typically have lower educational attainment and higher poverty rates than non-Hispanic whites. They have similar poverty rates and lower educational attainment than non-Hispanic blacks (DeNavas-Walt, Proctor and Mills 2004; Stoops 2004). 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.

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 U.S., regardless of U.S. 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. (1999) found no effects of immigrant status. John and Martorell (1989) found that use of the Spanish language was a predictor of breastfeeding among Mexican-American women. Byrd et al (2001) found that acculturation, as measured by language preference and country of origin, was associated with breastfeeding for Mexican-Americans.

The relationship between SES and breastfeeding in the U.S. 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. Low levels of acculturation for Mexican immigrants could account for this curvilinear pattern. Highly-educated U.S. mothers are probably breastfeeding despite the pressures to bottle-feed in U.S. culture because they know about the health advantages of breastfeeding. In contrast, less-educated immigrant mothers are breastfeeding because of traditional habits, not necessarily because they know about all the health benefits of the practice.

Acculturation is typically measured as immigrant generation or preferred language. This paper takes those common measures into account, but also includes measures of cultural engagement, traditional attitudes about gender roles, and frequency of church attendance. Cultural engagement is a direct measure of the importance of a cultural heritage to a person, and we might expect immigrants to exhibit higher levels of cultural engagement than the native-born. In the Hispanic community in the U.S., traditional attitudes about gender roles are prevalent, and this prevalence may decrease over time in the U.S. or over immigrant generations (Gil and Vega 1996; Rogler and Cooney 1984; Sabogal et al. 1987). Thus, adherence to these traditional values may be a marker of acculturation. Cultural engagement and traditional attitudes are hypothesized to impact breastfeeding decisions through a direct pathway from cultural attitudes about the behavior to individual decisions. In contrast, frequency of church attendance is thought to impact breastfeeding decisions because attending church frequently can help to maintain a Mexican cultural orientation, through reinforcing cultural ideals and through the influence of a broader, religious-based social network. We know that religious attendance has positive effects on health more broadly (Ellison et al. 2000), so perhaps it also impacts health behaviors. In other words, women who attend church frequently are more likely to come into contact with others like them on a regular basis, and this social network may influence child feeding decisions. Thus, this paper expands the current definition and measurement of acculturation by focusing on several possible influences on health behaviors. We hypothesize that low acculturation serves to encourage breastfeeding initiation and duration in the Mexican-American community, because low levels of acculturation may indicate adherence to traditional health practices (Balcazar and Krull 1999; Landale et al. 1999b).

Data

Most breastfeeding studies are clinical or qualitative studies with small sample sizes. Even studies with large samples usually do not have sufficient numbers of minorities or immigrants to examine their behavior in relation to other groups. This study uses data from the Fragile Families and Child Wellbeing Study, a national survey that follows a birth cohort of new (mostly) unwed parents and their children over a five year period. The baseline interviews, conducted between 1998 and 2000, contain information on 3,712 births to unmarried parents and 1,188 births to married parents, in 20 large U.S. cities. 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 one year and three years later, with the five-year follow-up currently in the field. 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. The Fragile Families study collects breastfeeding information at the one-year follow-up survey, which limits problems of retrospection for mothers. This paper uses data from both the first and second wave on a total of 4,368 mothers and children. Mothers with missing information on breastfeeding (n=27, <1.0%) were dropped from the sample. In order to reduce heterogeneity within the Hispanic category, the sample is limited to those

who self-identified as being of Mexican origin or as being white or black, yielding a total analytic sample of 3,626 mothers for the breastfeeding initiation analysis, comprised of 934 whites, 2,043 blacks, and 650 mothers of Mexican-origin (both foreign- and native-born). For the second analysis of breastfeeding duration, only mothers who began breastfeeding and answered how long they breastfed are included, for a total of 2,000 mothers, comprised of 629 whites, 919 blacks, and 452 mothers of Mexican-origin (both foreign- and native-born).

Variables

The outcome variable in the breastfeeding initiation models is an indicator measuring whether a mother ever breastfed her child. Background variables in both analyses include indicator variables for race/ethnicity and nativity (for Mexican-origin mothers), mother's age, education, Women, Infants, and Children Nutrition Program (WIC) participation, 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 (Humphreys et al. 1998; Peterson and DaVanzo 1992; Roe et al. 1999). Older women tend to have more education and life experience, and so may be more likely to breastfeed. Education (measured as a dummy variable for whether mother has a high school degree) also plays a role in determining breastfeeding, possibly because women with more education may better understand the benefits of breastfeeding than those with less (Humphreys et al. 1998; Roe et al. 1999; Stranahan 1988). Women who participate in WIC are low-income, and rather than including both income and WIC in the model, WIC participation is included as a marker for both income and government program participation. In recent years WIC has started a breastfeeding promotion campaign, and some evidence suggests that among low-income women, WIC participants are slightly more likely to breastfeed, but WIC does not impact duration (Chatterji and Brooks-Gunn 2004). Women with more than the one child (measured as a dummy variable) may be less likely to breastfeed, because they may have less time to devote to the practice. 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 additional support provided by their husband/partner (Guttman and Zimmerman 2000; Humphreys et al. 1998; Maclean 1988).

To measure acculturation, this paper incorporates measures of preferred language, attitudes about gender roles, religiosity, and cultural engagement. We include two variables concerning the level of cultural engagement, one variable indicating the extent of religious participation, two variables to capture traditional gender attitudes, and an indicator for whether the interview was completed in Spanish. This language measure is recognized as an important component of acculturation (Castro 1992). Cultural attachment is measured as the extent of agreement, (1) strongly disagree to (4) strongly agree, 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. Given the collinearity of these two items, they are summed to create a cultural engagement scale (Cronbach's alpha =.57). A higher score indicates less acculturation to mainstream American culture. Immigrants should score higher on this measure than non-immigrants, because they are more likely to maintain a greater connection with their heritage than U.S. natives. Religious participation is measured as frequency of church attendance, from (1) never to (4) every week or more. Traditional gender attitudes are measured as the extent of agreement, (1) strongly disagree to (4) strongly agree, 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. The two items are summed to create a scale for traditional gender attitudes (Cronbach's alpha=.53), and a higher score

indicates less acculturation to the U.S. Literature on Mexican-American culture indicates that immigrants tend to hold traditional views about gender roles and that these views may alter over time in the U.S. (Freeberg and Stein 1996; Gil and Vega 1996; Rogler and Cooney 1984; Sabogal et al. 1987).

Methods

The analysis comprises two parts. First, we use logistic regression, with models predicting whether the respondent ever breastfed her child. The first model adds only the indicators for Mexican immigrant generation (first or second). The second model adds the background variables discussed above. The third model includes the acculturation variables.

In the second analysis, we use discrete-time logit models to estimate the effects of acculturation on breastfeeding duration. For the breastfeeding duration analysis, the discrete model is appropriate because the time intervals in the data are not continuous, but are grouped by months. The inclusion of the duration dummies allows the hazard of quitting breastfeeding to vary by duration, which is important because there is no demonstrated baseline hazard of quitting breastfeeding. The model also deals well with heaping by allowing the hazard to spike at common weaning durations (i.e., women are most likely to report weaning at three, six, and nine months).

The equation for a discrete-time model takes this form:

$$\text{Log}(P(d)/(1 - P(d))=a(d)+b_1x_1+b_2x_2,$$

where P(d) refers to the probability of quitting breastfeeding at duration d, a(d) refers to 12 dummy variables that represent the duration (months) of breastfeeding, b_1 and b_2 are coefficients, and x_1 and x_2 are covariates (Allison 1985). Mothers who breastfed longer than 12 months are censored in the model. Each month that a mother breastfeeds, she contributes another record to the data, for a total of 9,679 records or person-months. Due to the clustered nature of the data, in both analyses, standard errors are corrected for clustering at the city level by using the Huber/White correction (Huber 1967; White 1980).

Results

Breastfeeding Initiation

Table 1 (Table 1 about here) presents the descriptive statistics for all variables in the analyses by ethnicity and nativity, for Mexican-origin mothers. Consistent with other positive pre- and post-natal health behaviors, Mexican immigrants are most likely to breastfeed their babies, at 86.4%, compared to 67.8% for whites, 45.4% for blacks, and 55.9% for Mexican-Americans. Additionally, conditional on having begun breastfeeding, Mexican immigrants do so for the longest average (censored) duration, at over six months, compared to whites at 5.24 months, blacks at 4.44 months, and Mexican-Americans at 3.68 months. Mexican immigrants are, on average, younger and have significantly less education and are more likely to participate in WIC than white mothers. Mexican immigrant mothers are also more likely to have other children than white mothers and a father is less likely to be present in a Mexican immigrant household, as compared with a white household. The same differences hold true for Mexican-American mothers compared to white mothers, although the differences are less pronounced; however, Mexican-Americans are less likely to live with the father of their baby than Mexican immigrants. Thus, despite being disadvantaged on many measures related to breastfeeding, Mexican immigrants are breastfeeding at very high levels.

For each acculturation variable we see a gradient from least acculturated (Mexican immigrants) to most acculturated (whites), with blacks and Mexican-Americans scoring somewhere in between. Interestingly, black and Mexican-American scores on the measures are quite similar, except that blacks report more frequent church attendance. Mexican immigrants score highest on cultural engagement and traditional gender views, while Mexican-Americans score in the middle and whites have the lowest scores on these measures. A similar pattern is observed for church attendance, although the white and Mexican-American averages are not statistically different. Interestingly, Mexican-Americans have a very low likelihood of completing the survey in Spanish, while 82.8% of Mexican immigrants did so.

Table 2 (Table 2 about here) presents odds ratios for the sequence of nested logistic regression models described above, where “ever breastfed” is the dependent variable. In the first model, only the race/ethnicity and nativity covariates are included. We see that without any controls, Mexican immigrant mothers have three times the odds of white mothers of initiating breastfeeding, black mothers have 60 percent lower odds of initiating breastfeeding, and Mexican-American mothers have 40 percent lower odds of initiating breastfeeding than white mothers. In the second model, the background variables are included. With the inclusion of these variables, Mexican immigrant mothers have five-and-one-third times the odds of breastfeeding as white mothers, while the white-black difference is reduced and Mexican-American mothers are now indistinguishable from white mothers. That is, if Mexican immigrant women were comparable on various background characteristics affecting the propensity to breastfeed, their rates would be considerably higher than whites, which is consistent with other Hispanic paradox findings. Mexican-Americans also have relatively high rates of breastfeeding, given that Mexican-American women also have less education and income, and perhaps more role strain (e.g., no father in the home to help with other tasks) than whites but are still breastfeeding at similar rates after controls.

Model 2 also shows that women who are older and who have completed high school have higher odds of breastfeeding. Having more than the one child decreases the odds of breastfeeding by 33%, while living with the father of their baby increases the odds of breastfeeding by 45%. WIC participation decreases the odds of breastfeeding by 27%. In Model 3, the acculturation variables are included, and they decrease the Mexican immigrant coefficient by about 20%, indicating that levels of acculturation explain a modest portion of the white-Mexican immigrant breastfeeding differential. Contrary to expectations, holding traditional gender views decreases the odds of breastfeeding for the sample, but each unit increase in the cultural engagement scale increases the odds of breastfeeding by 8%, and each unit increase in the frequency of church attendance scale increases the odds of breastfeeding by 18%. Although completing the interview in Spanish increases the odds of breastfeeding, this effect is not significant.

Breastfeeding Duration

Figure 1 (Figure 1 about here) shows the breastfeeding survival curves for whites, blacks, Mexican immigrants, and Mexican-Americans. A greater proportion of Mexican immigrant mothers are breastfeeding than any other group in every month, and more white mothers are breastfeeding than black mothers, followed by Mexican-American mothers, in each month. Table 3 (Table 3 about here) shows the results from the discrete-time logit models of breastfeeding duration. In Table 3, model 1 includes only the duration variables and the Mexican nativity indicators. The dummy variables for months of breastfeeding indicate that for every month except month 12, mothers have lower odds of quitting breastfeeding than in month 1. This indicates that getting through the first month of breastfeeding may be difficult but once that threshold is reached, mothers are less likely to quit. Without background

controls, Mexican immigrant mothers have lower odds of quitting breastfeeding than white mothers, while black and Mexican-American mothers have higher odds of quitting relative to white mothers. Model 2 controls for background characteristics, and here, as in the first analysis, we see evidence of an increased white-Mexican immigrant differential. Mexican immigrant mothers now have 39% lower odds of weaning than white mothers and black and Mexican-American mothers are not statistically different from white mothers. Controlling for acculturation in Model 3 eliminates the significance of the Mexican immigrant coefficient, indicating that acculturation accounts for much of the significant difference between white and Mexican immigrant mothers in duration of breastfeeding. Holding traditional gender views and frequent church attendance decrease the odds of quitting breastfeeding, and cultural engagement and completing the interview in Spanish do not impact breastfeeding duration.

Discussion

This paper tests two hypotheses regarding the Hispanic paradox. First, it tests the hypothesis that the paradox extends to breastfeeding initiation and duration. It also tests the hypothesis that acculturation accounts for this paradox, using new acculturation measures that incorporate attitudes about gender roles, cultural engagement, and church attendance. The analyses support both hypotheses. Breastfeeding represents another example of the Hispanic paradox for both initiation and duration, although the advantage is largely limited to Mexican immigrants, and the Hispanic paradox in breastfeeding initiation can be partially explained by varying levels of acculturation. Additionally, we see ethnic differentials in breastfeeding duration, and these differences are largely explained by acculturation measures. This paper presents 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.

The finding that the propensity to breastfeed depends on acculturation supports the results of a few other studies (de la Byrd et al. 2001; Romero-Gwynn and Carias 1989; de la Torre and Rush 1987). However, this paper goes beyond past work to demonstrate some new measures of acculturation that may be related to health behaviors. Most of the covariates in this analysis impact breastfeeding as expected, based on past studies. Having at least a high school degree increases the odds of initiating breastfeeding. Having more than one child decreased the odds of initiating breastfeeding and living with the father of the baby increased the odds of initiation, and having more than one child shortened the duration of breastfeeding as well. Although the paper shows that WIC participation decreases the odds of initiating breastfeeding and increases the odds of quitting, not all women in the sample are low-income and thus WIC is best interpreted as a proxy for low household income.

While the findings are significant for further understanding the determinants of immigrant health behavior differentials, the acculturation variables are somewhat limited. Also, the Fragile Families data contain only limited information on breastfeeding. Information regarding whether the mother breastfed exclusively would help to obtain a better picture of the actual breastfeeding behavior in the sample. Future studies of the relationship between immigrant generation and health behaviors should measure acculturation carefully and incorporate alternate measures of acculturation, including religiosity and cultural engagement.

This paper examines whether the breastfeeding initiation and duration differences between whites and Mexican immigrants, Mexican-Americans, and blacks are explained by differences in levels of acculturation, including language of interview, cultural engagement, traditional gender views, and religiosity. Mexican immigrants have significantly greater

odds of breastfeeding than whites, and breastfeed longer. Mexican immigrants are also breastfeeding more and for longer than Mexican-Americans, who in turn perform on par with whites after controlling for background variables. The results give credence to the idea that breastfeeding could contribute to observed health advantages of Mexican immigrants and U.S.-born Mexicans across the life course. Future research should attempt to tie breastfeeding to other health outcomes for Mexicans and other racial and ethnic groups. Additionally, the paper shows that controls for socioeconomic and family structure decrease the difference between blacks and whites in breastfeeding initiation, and eliminate the difference for breastfeeding duration. Thus, much of the observed differences in breastfeeding behavior for whites and blacks are accounted for by sociodemographic factors. It is beyond the scope of this paper to examine how the acculturation measures might account for differences between blacks and women of Mexican origin, but doing so might give insight into the process of acculturation more broadly, especially given that blacks and Mexican-Americans had similar scores on the acculturation measures, suggesting that over time in the U.S., women of Mexican-origin may come to look more like blacks on some characteristics.

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 (Balcazar and Krull 1999; Landale et al. 1999b; Sherraden and Barrera 1997). This hypothesis is supported in this paper, as the acculturation measures account for some of the white-Mexican immigrant difference in breastfeeding initiation and much of the difference in breastfeeding duration. More research, however, is needed to understand the cultural transmission of health behaviors and why the health behaviors of immigrants deteriorate over time in the United States.

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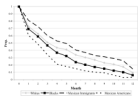

Figure 1.
Proportion of Mothers Still Breastfeeding by Month, by Race/Ethnicity and Nativity

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Table 1

Descriptive Statistics for Fragile Families Mothers

Variable	Whites Mean or % (S.D.)	Blacks Mean or % (S.D.)	Mexican Immigrants Mean or % (S.D.)	Mexican-Americans Mean or % (S.D.)
Dependent Variables				
Ever Breastfed Child	67.8%	45.4%***	86.4%***	55.9%***
Breastfeeding Duration[1] *(Months)*	5.24(4.25)	4.44(3.67)***	6.13(4.29)**	3.68(3.49)***
Background Variables				
Age	27.12(6.52)	24.41(5.73)***	25.91(5.47)**	23.19(5.02)***
High School Degree	82.1%	67.5%***	27.5%***	55.9%***
WIC Participation	46.9%	81.1%***	84.8%***	80.1%***
Not Only Child	54.1%	66.1%***	62.3%**	60.8%*
Father Lives In Home	80.8%	46.8%***	72.8%**	64.8%***
Acculturation				
Cultural Engagement	5.43(1.62)	5.96(1.74)***	6.62(1.66)***	5.94(1.66)***
Traditional Gender Views	3.88(1.23)	3.98(1.17)*	5.20(1.24)***	4.08(1.16)**
Freq. of Church Attendance	2.52(1.06)	2.68(1.08)***	3.18(0.95)***	2.57(1.06)
Interview in Spanish	0%	0%	82.8%***	2.3%**
N	934	2,043	302	348

#p<.10,

*p<.05,

**p<.01,

***p<.001, two-tailed tests, denotes significant difference between whites and the other groups.

[1]Given mother began breastfeeding (N=2000).

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Table 2

Results of Logistic Regression Analyses Predicting Breastfeeding Initiation by Race/Ethnicity, Nativity, and Social and Cultural Characteristics[2]

Variable	Model 1 *Odds Ratios*	Model 2 *Odds Ratios*	Model 3 *Odds Ratios*
(White)			
Black	0.39***	0.57***	0.51***
Mexican Immigrant	3.02***	5.31***	3.84***
Mexican-American	0.60*	0.88	0.81
Background			
Age		1.01*	1.01
High School Degree		1.92***	1.80***
WIC Participation		0.73***	0.77**
Not Only Child		0.67***	0.68***
Father Lives In Home		1.45***	1.43***
Acculturation			
Cultural Engagement			1.08***
Traditional Gender Views			0.93*
Frequency of Church Attendance			1.18***
Spanish Interview			1.24
N	3,626	3,624	3,596
Model chi-square(df)	335.15(3)***	412.87(8)***	862.22(12)***

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

#p<.1,

*p<.05,

**p<.01,

***p<.001, two-tailed tests.

[2]The standard errors are corrected for clustering at the city level using the Huber/White correction.

Table 3

Results of Discrete-Time Logistic Regression Analysis Predicting Weaning, by Race/Ethnicity, Nativity, and Social and Cultural Characteristics[6]

Independent Variables	Model 1 Odds Ratio	Model 2 Odds Ratio	Model 3 Odds Ratio
Time (1 month)			
2 months	0.41***	0.42***	0.43***
3 months	0.63***	0.66***	0.67***
4 months	0.54***	0.56***	0.58***
5 months	0.26***	0.27***	0.28***
6 months	0.68**	0.73*	0.75*
7 months	0.35***	0.38***	0.39***
8 months	0.36***	0.39***	0.40***
9 months	0.35***	0.37***	0.39***
10 months	0.37***	0.39***	0.41***
11 months	0.23***	0.24***	0.25***
12 months	1.90**	2.06**	2.08**
Sociodemographic (White)			
Black	1.33***	1.06	1.09
Mexican Immigrant	0.80**	0.61***	0.87
Mexican-American	1.60**	1.23	1.27#
Age		0.98***	0.98***
High School Degree		0.91	0.90#
WIC Participation		1.34***	1.34***
Not Only Child		0.86**	0.86*
Father Lives in Home		0.91	0.93
Acculturation			
Cultural Engagement			0.98
Traditional Gender Views			0.94*
Freqency of Church Attendance			0.94*
Spanish Interview			0.82
Model Chi-square[7] (df)	434.17(14)***	516.96(19)***	519.22(23)***
N (Person-months)	9,679		

[6] The standard errors are corrected for clustering at the city level using the Huber/White correction.

[7] From unclustered model.