

# Obesity Risk in Children: The Role of Acculturation in the Feeding Practices and Styles of Low-Income Hispanic Families

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## Abstract

**Background:** Parent feeding has been associated with child overweight/obesity in low-income families. Because acculturation to the United States has been associated with increased adult obesity, our study aim was to determine whether acculturation was associated with feeding in these populations.

**Methods:** Low-income Hispanic mothers of preschoolers were recruited to participate in a longitudinal study examining child eating behaviors. At baseline, mothers completed questionnaires on feeding styles, feeding practices, and acculturation. Regression analyses compared feeding styles and food parenting practices of first-generation, immigrant mothers born outside the United States ( $n=138$ ) and mothers born in the United States ( $n=31$ ). The correlates of acculturation with these same constructs were also examined.

**Results:** Immigrant mothers reported using highly directive food parenting practices more often than mothers born in the United States, including pressuring their child to consume more food, using food as a reward, and controlling child food intake by limiting less-healthy foods. First-generation mothers were more likely to show authoritarian, and less likely to show indulgent, feeding styles. Greater maternal acculturation was associated with less restriction of food for weight reasons.

**Conclusions:** Although first-generation, immigrant mothers reported using highly controlling food parenting practices with their children, those born in the United States were more indulgent with their children in the feeding context. Mechanisms that promote greater indulgence in more-acculturated mothers need to be identified.

## Introduction

The immigrant paradox, the tendency of second- and third-generation immigrants to have poorer health outcomes than first-generation immigrants, despite having more economic and social resources,<sup>1,2</sup> has been the focus of much discussion and debate in the academic community. This phenomenon is labeled a paradox, because traditional models of cultural assimilation predict better outcomes across generations.<sup>3,4</sup> Besides applying to the health of adults, the immigrant paradox also applies to childhood obesity, with second- and third-generation children from Asia and Latin America having higher levels of obesity than first-generation immigrants.<sup>5-8</sup> This has led

scholars, such as Garcia-Coll and Marks,<sup>9</sup> to ask the question, “Is becoming American a developmental risk?”

If exposure to and adoption of US lifestyles increases the risk of childhood obesity, one would expect positive relationships between acculturation and obesity in immigrant populations. The data on this, however, are mixed. In studies of Hispanic children (the focus of the current article), some studies uncovered a positive association between maternal or child acculturation and child weight status<sup>10,11</sup> and some showed a negative relationship.<sup>12,13</sup> The data for Hispanic adults are also inconsistent. In a recent systematic review of nine studies of Hispanic adults, Delavari and colleagues<sup>14</sup> found that six studies showed a positive relationship between adult acculturation and BMI,

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whereas the other three found a negative relationship (especially for women). Insufficient research has been conducted in this area to determine whether these differences in results are owing to the measures of acculturation employed; the countries of origin; regional or neighborhood differences; or other factors.

Studies conducted to explain the lower rates of child and adult obesity in first-generation Hispanic immigrants have identified a number of factors that could contribute to these differences in obesity rates. Compared to later generations, first-generation Hispanic immigrant children and/or adults eat more fruits and vegetables<sup>15–19</sup>; eat more rice<sup>11,16</sup>; drink less soda<sup>15,16</sup>; eat less fast food, cheese, and/or high-calorie snacks<sup>11,16</sup>; and show lower levels of sedentary behavior<sup>6,11</sup> (although first-generation adults engage in less exercise than later generations<sup>20,21</sup>).

Although these lifestyle and consumption patterns might explain some of the differences in childhood obesity between first and later generations, it is possible that other aspects of children's eating environments (such as maternal feeding practices or styles) might change with acculturation as well, increasing obesity risk. A growing body of research now supports the idea that parental feeding styles and practices can increase young children's obesity risk by influencing children's eating behavior. Although studies of white, middle class families suggest that highly controlling or restrictive feeding practices may contribute to obesity by over-riding children's responsiveness to internal satiety cues,<sup>22</sup> a series of studies by Hughes and colleagues<sup>23–29</sup> suggest that highly permissive, indulgent feeding patterns are the feeding styles related to child obesity in low-income, Hispanic samples. By providing their children with little structure and high levels of responsiveness, parents with indulgent feeding styles may contribute to childhood obesity by providing their children with insufficient guidance and direction in today's obesogenic food environment.

Only three studies have examined differences in feeding practices as a function of acculturation or generational status in low-income Hispanics.<sup>30–32</sup> All three studies assessed acculturation using the primary language spoken in the home. Two studies<sup>30,32</sup> assessed feeding practices using the Preschool Feeding Questionnaire<sup>33</sup> that yields several parental feeding-related factors; the researchers in the other study<sup>31</sup> developed their own 12-item questionnaire assessing different feeding practices derived from focus groups with Mexican American mothers (separate analyses were run on each item). The most consistent findings were that less-acculturated parents placed more pressure on their children to eat and were more likely to use food for non-nutritive purposes. Specifically, less-acculturated mothers were more likely to push or force their children to eat,<sup>31,32</sup> use positive incentives (including food) to get their children to eat,<sup>32</sup> report scolding their child for not eating well,<sup>31</sup> use food to calm their children,<sup>30–32</sup> and use food as a reward.<sup>31</sup> Two findings were inconsistent with this general trend—less-acculturated mothers were more likely to give their children control of the feeding situation (*i.e.*, let their chil-

dren choose foods from what is served and allow children to snack whenever they like)<sup>32</sup> and offer other foods when the child does not like what is served.<sup>31</sup>

Although these findings provide some preliminary insights into the effects of acculturation on maternal feeding practices, these researchers studied only a limited number of feeding practices and did not directly assess indulgent feeding styles. The aim of the present research was to assess the impact of acculturation on the feeding styles and practices of immigrant first-generation versus later-generation, low-income Hispanic mothers by using two widely used and validated feeding questionnaires: The Caregiver's Feeding Style Questionnaire (CFSQ)<sup>23</sup> and the Comprehensive Feeding Practices Questionnaire (CFPQ),<sup>34</sup> and a validated measure of acculturation. The correlates of acculturation were examined in two ways: by comparing the feeding styles of first-generation, immigrant mothers and mothers born in the United States and by examining the correlation between mothers' responses to a well-validated acculturation questionnaire and maternal feeding practices. To more directly examine the effect of acculturation, maternal education was controlled for in the analyses. We expected that as mothers became more acculturated they would be more likely to show the indulgent feeding style identified by Hughes and colleagues.<sup>23–29</sup> Given this increased level of permissiveness with acculturation, we expected that more-acculturated mothers would be less likely to use high-pressure tactics to get their children to eat.<sup>23</sup> Finally, consistent with the studies reviewed above,<sup>30–32</sup> we expected that with acculturation, mothers would be less likely to use food for non-nutritive purposes.

## Methods

### Design

A secondary analysis of baseline data from a larger 18-month longitudinal study of child eating behaviors among low-income Hispanic preschoolers and their primary caregivers was used. Demographics, acculturation, child feeding styles, and feeding practices were assessed by self-report questionnaires. Child BMI was assessed using measured heights and weight.

### Participants

Participants were 169 low-income preschoolers attending Head Start programs and their parent who had primary responsibility for feeding. The larger study involved 187 mothers, but acculturation data were not available on 18 mothers because this questionnaire was added to the study protocol after data collection had begun. Recruitment procedures included presentations at parent meetings, flyers placed at Head Start centers and sent home with the child, and active recruitment by Head Start teachers. Parents reviewed and signed consent forms in their language of choice (English or Spanish) before participating in the study, with questions addressed by study personnel. All parents recruited into the study were mothers except for two grandmothers

(herein referred to as mothers). Close to 80% of the mothers were born outside of the United States, with the majority from Mexico (77%) and the rest from Central America (21%) or other countries (2%). Mothers received a total of \$90 for participating in the study. The study was reviewed and approved by the institutional review board. Mother and child characteristics are presented in Table 1.

### Procedures

The recruited mother and her preschool-age child came into the study laboratory on 2 days to participate in observational tasks not relevant to the present article. Questionnaires were completed by the mother on the second day while the child was participating in tasks not involving the mother. Height and weight measures were taken on the child. Seventy-nine percent of the questionnaires were completed in Spanish.

Characteristic	n = 169 (%)
Parent sex: female	100.0
Child sex: female	48.5
Child age, mean in months (SD)	57.6 (5.3)
Education of parent	
Sixth grade or less	13.6
Eighth grade or less	16.6
Attended some high school	10.7
High school graduate or GED	24.3
Completed technical school	13.6
Attended some college	14.2
College graduate	7.1
Marital status	
Married	59.8
Never married	12.4
Widowed, separated, divorced	27.8
Employment status, currently employed	23.7
Child BMI categories	
Normal (<85 percentile)	52.7
Overweight (85th to <95th percentile)	20.1
Obese (≥95th percentile)	27.2
Immigrant status	
Born in the United States	18.3
Born in Mexico	61.5
Born in Central America	19.0
Born in another country	1.2

SD, standard deviation; GED, General Educational Development.

### Measures

*Caregiver's Feeding Styles Questionnaire.* The CFSQ was used to measure parent feeding styles.<sup>23</sup> The CFSQ measures the overall feeding pattern of parents based on two dimensions of demandingness and responsiveness. Dimensions are derived through seven child-centered and 12 parent-centered feeding directives measured on a 5-point Likert scale (ranging from *never* to *always*). Responsiveness or child-centered feeding promotes child autonomy (*e.g.*, reasoning, complimenting, and helping the child to eat); demandingness or parent-centered feeding controls child eating through external pressure (*e.g.*, demands, threats, and reward contingencies). A cross-classification of high- and low-dimension scores was used to identify four feeding typologies: authoritative (high responsiveness, high demandingness); authoritarian (low responsiveness, high demandingness); indulgent (high responsiveness, low demandingness); and uninvolved (low responsiveness, low demandingness). Evidence of test-retest reliability, internal consistency, and convergent and predictive validity has been demonstrated.<sup>23</sup> Confirmatory factor analyses supported equal reliability and validity for African American and Latino parents.<sup>35</sup> A more complete discussion of the scoring procedure can be found in a previous study.<sup>23</sup> Cronbach's alphas were acceptable in this sample: child-centered and parent-centered feeding (alpha of 0.67 and 0.84, respectively).

*Comprehensive Feeding Practices Questionnaire.* The CFPQ was used to assess maternal feeding practices.<sup>34</sup> The parent-report questionnaire consists of 49 items measuring a broad range of parental feeding practices with preschool- and elementary school-age children. The 12 subscales include child control (allowing the child control of his or her eating behaviors), emotion regulation (the use of food to regulate the child's emotional states), encourage balance and variety (promoting well-balanced food intake), environment (making healthy foods available in the home), food as reward (the use of food as a reward for good behavior), involvement (encouraging child involvement in meal planning and preparation), modeling (actively demonstrating healthy eating), monitoring (keeping track of less healthy child food intake), pressure (pressuring the child to consume more foods at meals), restriction for health (limiting less-healthy foods and sweets), restriction for weight control (controlling child food intake to decrease or maintain child weight), and teaching about nutrition (using didactic techniques to encourage child intake of healthy foods). Reliability and validity of the measure have been established in previous studies,<sup>34</sup> and the instrument has been successfully used in low-income samples.<sup>36,37</sup> Cronbach's alphas were acceptable in the current sample—between 0.61 and 0.86 for most of the subscales with the exception of the environment subscale (alpha of 0.56); the food as a reward subscale (alpha of 0.50); and the teaching about nutrition subscale (alpha of 0.29). The teaching about nutrition subscale was dropped from further

analyses; the other two subscales were retained despite the borderline alphas because they assessed constructs that were of interest in this study.

*Bidimensional Acculturation Scale.* The Bidimensional Acculturation Scale (BAS) was used to measure mothers' acculturation to the US culture.<sup>38</sup> The BAS has been identified as one of the best measures of acculturation with the greatest validity and reliability compared to other acculturation scales.<sup>39</sup> It consists of three subscales: language use with six items (e.g., How often do you speak English?), language proficiency with 12 items (e.g., How well do you read in English?), and electronic media with six items (e.g., How often do you watch television programs in English?). Four response categories are used for the language use and electronic media items (almost never, sometimes, often, and almost always); a different set of response categories are used for the language proficiency items (very poorly, poorly, well, and very well). As originally described by Marin and colleagues,<sup>38</sup> the three subscales were combined to create a Spanish domain and an English domain, which had high internal consistency in the original study (alpha of 0.90 and 0.96, respectively). The BAS is appropriate for multiple Hispanic groups and had appropriate validity coefficients with the generation in the United States, age at arrival to the United States, and proportion of life in the United States.<sup>38</sup> Cronbach's alphas were acceptable in this sample: Spanish and English domains (alpha of 0.92 and 0.97, respectively). Because there was very little variability in the Spanish domain score (almost 90% of the participants had a score of 3 or above on a scale of 1 to 4), we used only the English domain score in the analyses.

### Statistical Analyses

Multiple linear regression analyses (with all predictors entered simultaneously) examined feeding styles and food parenting practices of first-generation immigrant mothers (those born outside the United States;  $n=138$ ) versus mothers born in the United States ( $n=31$ ). Differences across child sex and correlates of maternal acculturation and education were also examined. Independent variables were child sex, immigrant status, maternal acculturation, and maternal education. Dependent variables included four feeding-style categories (CFSQ; authoritarian, authoritative, indulgent, or involved) and 11 food parenting practices (CFPQ). Four logistic regressions were run for the feeding-style categories (one for each category dichotomously coded).

## Results

Before running the regressions, the correlations between the predictor variables were examined. As expected, first-generation immigrants had lower levels of education ( $r(185)=-0.34$ ;  $p<0.001$ ), first-generation immigrants had lower levels of acculturation ( $r(167)=-0.62$ ;  $p<0.001$ ), and more-acculturated mothers had higher levels of edu-

cation ( $r(167)=0.44$ ;  $p<0.001$ ). No other correlations between the predictors were significant. Because of the high correlation between immigrant status and acculturation, collinearity statistics were examined to examine possible multicollinearity. Multicollinearity was not an issue: All of the variance inflation factors (VIFs) were less than 2.0 (typically, concerns about multicollinearity arise when the VIFs are greater than 5).

Presented in Table 2 are the results of the regressions predicting the 11 food parenting practices (CFPQ) from child sex, maternal immigrant status, maternal acculturation, and maternal education. As can be seen in the table, immigrant status was significant for 3 of the 11 food parenting practices and acculturation was associated with only one of the food parenting practices. First-generation, immigrant mothers were more likely to use food as a reward, pressure the child to eat, and restrict their child's eating for health-related reasons. Two effects of child sex were significant: Mothers of boys were more likely to use food for emotion regulation and use food as a reward than mothers of girls.

Two of the four logistic regressions for feeding styles were significant or near significant: indulgent style ( $X^2(4)=14.29$ ;  $p<0.01$ ) and authoritarian style ( $X^2(4)=8.92$ ;  $p=0.06$ ). These effects were owing to immigrant status. The odds ratios (ORs) showed that first-generation, immigrant mothers were less likely to show the indulgent style than mothers born in the United States ( $B=-1.17$ ; standard error [SE]=0.53;  $p<0.05$ ; OR=0.31) and were more likely to show the authoritarian style ( $B=1.03$ ; SE=0.61;  $p<0.10$ ; OR=2.79).

Because so few effects were significant for the acculturation variable, separate regressions were run for first- and later-generation immigrants for each of the dependent variables. Independent variables for these analyses were child sex, maternal acculturation, and maternal education. None of the regressions were significant for the later-generation immigrants (probably because of the small sample size). Only two regressions were significant for the first-generation immigrants: As was the case for the combined sample, acculturation was negatively associated with restriction for weight control (beta=-0.20;  $p<0.05$ ) and was positively associated with maternal monitoring (beta=0.19;  $p<0.05$ ) (in the combined sample, the monitoring effect was near-significant: beta=0.19;  $p<0.07$ ).

## Discussion

The aim of this study was to examine the relationships between acculturation and feeding practices and feeding styles among low-income, Latina mothers. Two measures of acculturation were employed: generational status (first-generation, immigrant mothers compared to mothers who had been born in the United States) and a questionnaire measure of acculturation assessing language proficiency and usage. These analyses controlled for child sex and maternal education. Results showed many more effects for generational status than for the acculturation questionnaire.

**Table 2. Regression Analysis of Child Sex, Immigrant Status, and Mothers' Education on Feeding Practice Measures Using Subscales from the Comprehensive Feeding Practices Questionnaire (CFPQ) (n = 169)**

Dependent variables: CFPQ subscales		Child sex (coded as 1 = male; 2 = female)	Immigrant status (coded as 1 = later generation; 2 = first generation)	Acculturation (higher scores reflect more English acculturation)	Mother education (higher scores reflect higher education)
	F	Standard beta	Standard beta	Standard beta	Standard beta
Child control	0.28	0.02	-0.07	-0.09	-0.02
<b>Emotion regulation</b>	<b>3.60**</b>	<b>-0.16*</b>	0.04	-0.14	-0.09
Encourage balance and variety	0.56	0.05	0.06	0.14	-0.02
Environment	.38	-0.07	0.02	-0.05	0.05
<b>Food as reward</b>	<b>2.84*</b>	<b>-0.17*</b>	<b>0.19*</b>	0.05	-0.04
Involvement	1.19	0.04	0.12	0.19	0.04
Modeling	1.02	-0.03	0.17	0.12	-0.08
Monitoring	2.09	0.12	0.12	0.19	0.08
<b>Pressure</b>	<b>3.54**</b>	-0.02	<b>0.24*</b>	0.02	-0.10
<b>Restriction for health</b>	<b>3.60**</b>	-0.06	<b>0.24*</b>	0.04	-0.12
<b>Restriction for weight control</b>	<b>7.69***</b>	-0.03	0.14	<b>-0.23*</b>	-0.11

Standard beta = standardized beta coefficient.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p \leq 0.001$ .

Dependent variables with significant effects are bold.

Specifically, first-generation, immigrant mothers (mostly from Mexico and around one fifth from Central America) were more likely to use food as a reward, pressure their children to eat, and restrict children's eating for health reasons than mothers born in the United States. Consistent with these findings was the finding that first-generation, immigrant mothers were more likely than mothers born in the United States to have an authoritarian feeding style (high demandingness and low responsiveness) and less likely to have an indulgent style (low demandingness and high responsiveness). These results are consistent with two previous studies that found that less-acculturated mothers were more likely to pressure their children to eat,<sup>31,32</sup> use food as a reward,<sup>31</sup> use incentives to get their child to eat,<sup>32</sup> and scold their children for not eating.<sup>31</sup> These findings were consistent with our hypotheses that less-acculturated mothers would be more likely to use high-pressure tactics to get their children to eat and use food for non-nutritive purposes. They also extend the previous literature, indicating that less-acculturated mothers may be more likely to restrict consumption of certain foods for health reasons and that more-acculturated mothers are more likely to show an indulgent feeding style. The observed associations were not owing to differences in maternal education, because education was controlled for in the analyses and showed no significant relationships with feeding.

In contrast to the analyses of differences between immigrant mothers and those born in the United States, only one association was found between acculturation (as assessed by English-language competency and usage) and feeding: More-acculturated mothers were less likely to restrict their child's eating for weight control reasons. No unique associations were found when the relationships between maternal acculturation and feeding were examined separately by generational status (although the small sample of mothers born in the United States likely reduced the power to find such differences).

Given that numerous studies of low-income Hispanic children show that indulgent feeding is associated with childhood obesity,<sup>23-29</sup> one factor that might contribute to the higher rates of obesity found among second- and third-generation Hispanic children (compared to first-generation immigrants) is that many low-income Hispanic mothers born in the United States show an indulgent feeding style. Although it is not clear why this is the case, one possibility is that when immigrant mothers come to the United States, they try to control their children's consumption of food by restricting foods that they believe are unhealthy (e.g., sweets, high-fat foods) and pressuring their children to eat healthy ones (e.g., fruits and vegetables). Mothers born in the United States, in contrast, may develop a preference for many of the foods that their mothers thought were

unhealthy and therefore allow their children to consume them—adopting a more indulgent feeding style. Moreover, given the high levels of advertising for calorie-dense, low-nutrient foods in the United States,<sup>40</sup> mothers born in the United States may have believed that these foods were desirable for their children and may have not restricted their consumption. It is also possible that these mothers may more often be pressured by their children to buy such foods and may acquiesce as a way of supporting their children's integration into the US culture.

The finding that acculturation, as measured by language proficiency and usage, showed few relationships with maternal feeding patterns or styles shows that the feeding practices and styles associated with coming to the United States apparently operated independently of how integrated the mothers were into the US culture. However, it is possible that if the acculturation measure had assessed maternal food preferences and consumption (e.g., Mexican vs. US), the acculturation measure may have been a more effective predictor in the current study.

Only 4 of the 11 feeding practices and only two of the four feeding styles showed significant effects of acculturation. All of the significant findings had to do with highly controlling feeding practices (i.e., food as reward, pressure to eat, restriction, and authoritarian feeding style) or a lack thereof (indulgent feeding style). Acculturation was not associated with low-pressure strategies (i.e., child control, modeling, monitoring, involvement, and authoritative feeding style) or with measures of the food environment (ensuring balance and variety, food environment). Thus, mothers' use of the latter strategies was independent of their generational status or acculturation. It is possible that such low-pressure strategies were not affected by acculturation, possibly because they are normative in both the US culture and their cultures of origin.

### Limitations

There were a number of limitations to this work. All of the data on the feeding behaviors and acculturation of the mothers were based on self-report measures. Mothers' reports of their own behaviors may provide restricted information regarding the actual feeding behaviors that take place in the home setting during meals. Observational studies may provide a more comprehensive picture of the parent-child feeding dynamic. Finally, this study does not provide any information on the influences of fathers or other relatives in the home that may impact the mealtime dynamics that take place in homes of Hispanic families.

### Conclusions

Extensive literature exists on factors that may impact the eating behaviors of young children—especially those who are at risk for developing childhood obesity. Recent data show that Hispanic children in the United States are at a higher risk for developing childhood obesity relative to other ethnic groups.<sup>41</sup> Our results suggest that when mothers

come to the United States, they are at risk for developing the indulgent feeding style that puts the children of low-income, Hispanic mothers at risk for childhood obesity. These results provide important information that could help when intervening with Hispanic immigrant families with the aim of reducing childhood obesity risk. Future studies need to identify the actual mechanisms that may promote greater indulgence in more-acculturated Hispanic families for use in obesity prevention studies designed for Hispanic families.

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### Author Disclosure Statement

No competing financial interests exist.

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