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Maternal Ratings of Child Health and Child Obesity, Variations by Mother's Race/Ethnicity and Nativity

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Abstract

Objective—We examined whether indicators of child health, focusing on obesity, are associated with maternal ratings of child health (MRCH) and its variation by mother's ethnicity/nativity, focusing on Hispanics.

Methods—The Early Childhood Longitudinal Study, Kindergarten cohort (ECLS-K) kindergarten-eighth grade waves (n=48,814) and nested general linear mixed modeling are used to examine excellent MRCH.

Results—The only indicator of child health that varies by mother's ethnicity/nativity for MRCH is child obesity. Child obesity did not influence MRCH for foreign-born Hispanic mothers, especially among less acculturated mothers, though significant differences among immigrants by acculturation were not found. However, among native-born white, black, and Hispanic mothers child obesity was associated with a lower likelihood of excellent MRCH even after controls for socioeconomic characteristics, family characteristics, and other indicators of child health are included.

Conclusions—MRCH reflect not only child's actual health, but also the mother's perception of what contributes to poor child health. Our findings suggest that less acculturated foreign-born Hispanic mothers are less likely to associate child obesity with poor child health. Cultural orientations that prefer heavier children or are unlikely to associate child obesity with poor child health may contribute to the higher levels of obesity found among their children.

Keywords

Children of immigrants; child obesity; acculturation; Hispanics; parental assessed child health

INTRODUCTION

An understanding of the future health profile of the United States must incorporate immigrants and their children given their size and predicted growth. The demographic importance of children of immigrants (COI) has grown sharply; one in four children now has at least one foreign-born parent which is projected to rise to 30 percent by 2020 (1). Past research has consistently shown that COIs in the U.S. experience advantageous early

childhood health (e.g. birth outcomes, prenatal health, and maternal health behaviors) compared to children of natives (CONs), despite socioeconomic disadvantages (2–6). These findings are especially true among Hispanic-origin COIs (2, 3). Yet, recent research questions the extension of this health advantage into early and middle-childhood for COIs, especially as it applies to children's weight status (7, 8).

Cultural orientations immigrants bring from their origin countries are thought to promote healthier behaviors and shield immigrants from the potentially deleterious U.S. health environment. These orientations are cited as potential mechanisms which contribute to more favorable child health outcomes (3, 5) (9–12) and include healthier prenatal and perinatal behaviors and the beneficial nutritional content of traditional diets (13–15). Nonetheless, cultural orientations that promote infant health, including lower prenatal substance use and breastfeeding, may be supplanted by orientations that result in worse early and middle child health. These cultural orientations may include parenting practices and larger family sizes (16).

One potential source of information about a mother's cultural orientation towards health comes from maternal ratings of her child's health (MRCH). MRCH reflect a child's actual health as well as the mother's cultural orientation and perception of what constitutes poor child health. Additionally, MRCH is a commonly used indicator of child health and correspond to actual measures of health (17). If different groups with different shared cultural characteristics view certain child health conditions—such as obesity—as more (or less) serious, than these views will be reflected in MRCH for children with these conditions.

However, the extent to which MRCH reflects a child's weight status, specifically for Hispanic-origin COIs, has not been examined. Obesity is an important health indicator for young children and is associated with a wide range of comorbidities and a high degree of tracking into adolescence and early adulthood (18, 19). Additionally, Hispanic children, especially those with foreign-born mothers, have high prevalence rates of obesity (7, 8, 20).

In addition to having high rates of obesity, past research indicates that foreign-born Hispanic mothers are less likely to assess their child's health as excellent or good compared to native-born Hispanic mothers (21). However, Hispanic mothers are less accurate in their perception of their child's weight than other race/ethnic groups (22) and parents of heavy children consistently underestimate their child's weight (23, 24). Additionally, qualitative research on Hispanic immigrant mothers, especially less acculturated immigrant mothers, demonstrates that they are less likely to view child obesity as a health concern and that these orientations are related to origin country norms (25, 26). In this context, lower parental acculturation may contribute to a greater likelihood to maintain cultural orientations associating child fatness with child health.

This study examines whether cultural orientations among immigrant mothers may be a risk factor for child obesity by examining the associations between MRCH and child obesity by mother's nativity focusing on Hispanic-origin mothers. To overcome the limitations of prior research that relied on non-probabilistic, small, regional, and/or cross-sectional samples, this research uses a nationally representative, longitudinal dataset: the Early Childhood

Longitudinal Study, Kindergarten cohort (ECLS-K). This sample is representative of U.S. children who were either enrolled in kindergarten in the fall of 1997 or first grade in the fall of 1998. ECLS-K follows children from kindergarten to eighth grade and contains clinical measures of child's height and weight to determine obesity and parental assessments of child health. We examine whether MRCH vary by race/ethnicity and nativity for additional indicators of child health. We run these models as sensitivity tests to confirm that cultural orientations influence immigrant mothers' association of child obesity with child health, rather than immigrant mothers assess child health differently than native-born mothers. Understanding how mothers view child obesity in relation to child health and how these understandings vary by nativity and acculturation will provide valuable information on how to design and target interventions and prevention programs for the large and growing COI population.

METHODS

Data Source and Participants

This study uses the public access ECLS-K which first assessed a cohort of kindergarteners in the U.S. in 1998 (n=21,260), and followed them through first grade (n=16,730), third grade (n=14,470), fifth grade (n=11,350), and eighth grade (n=9,360) (27). Attrition reflects natural sample design and children lost to follow-up. The baseline sample was selected using a three-stage probability-sampling design to ensure national and regional geographical representation. Our analytical sample is limited to children whose biological mothers responded to the parent survey in all waves (93.2% of the sample). Unfortunately, questions concerning mother's place of birth are not asked until the spring of first grade when approximately 85% of the original fall kindergarten sample is eligible to participate. We further limit to children whose mother is a native-born non-Hispanic white, non-Hispanic black, Hispanic, or foreign -born Hispanic (86.9% of the sample). Lastly, an additional, 18% of respondents are missing on other key study variables Preliminary analyses¹ suggest that this missingness is not introducing bias and hence multiple imputations is deemed an appropriate method (28, 29). We have a final sample of 48,814 cases for 12,104 children. This research was approved by the Institutional Review Board.

Outcome variable

Maternal ratings of child health are measured in all five waves of data collection. Mothers are asked "Would you say (child)'s health is: excellent, very good, good, fair, or poor?" This variable is dichotomized as excellent (=1) and not excellent (=0). Additional analyses examined ordinal measures of health using the full range of responses produced substantively similar results.

¹Preliminary analyses included examining whether missing on key focal independent variables (included as separate variables) is associated with the outcome variable, excellent MRCH for the first wave. We find that, compared to children without missing data on mother's nativity, children who were missing this information had greater odds of having excellent MRCH. However, this greater likelihood is fully mediated by family socioeconomic status, which is included as a control in the focal analyses of the paper. Additionally, several different sample restriction for the multiple imputations were examined. First we used the same sample restrictions concerning nativity, race/ethnicity, and whether the mother is biological for the multiply imputed sample that are used in the analysis sample. Second, we imputed values for the variables used to restrict the analysis sample and then limited the sample after the imputations are performed. Results were virtually identical for both methods of multiply imputing the sample. As such, we restrict the sample used in the multiple imputations using the same criteria for the analysis sample.

Independent variables

Child obesity is the primary independent variable. Obesity is determined based on measured height and weight of the children at each grade and transformed into body mass index (BMI), $\text{weight (kg)/height (m)}^2$. Obesity is defined as a BMI at or above the 95th percentile using the U.S. Centers for Disease Control reference population and procedures (30) which account for developmental differences in growth by age and gender. Lagged and concurrent measures of obesity were both examined. Concurrent measures of obesity were better predictors of MRCH than lagged measures.

Other indicators of child health are also examined and include activity level, vision difficulty, birth weight, born early term, and disability status and are all determined from the mother's report. Vision difficulty is assessed by whether the mother reported receiving a diagnosis of a vision problem for the child from a professional. Birth weight is categorized as low (less than 2,500 grams), average (2,500 to 3,999 grams), and high (4,000 grams or heavier). Early term status is determined by whether the mother reported that the child was born prior to the 38th week of gestation. Activity level is assessed by asking the mother to compare her child's activity level to the child's same age peers and is categorized as less active, about as active, slightly more active, and a lot more active. Finally, disability status is measured by whether the mother reported that the child has a disability. Birth weight and early term status are time-constant; the other indicators of child health are assessed at each wave.

Mother's ethnicity/nativity is determined by the mother's report of birth place and race/ethnicity. Race/ethnicity is henceforth referred to as ethnicity. Mothers are considered foreign-born if they are born outside the U.S. or in the U.S. territories including Puerto Rico or native-born if they are born inside the U.S. The variables are combined and coded as native-born non-Hispanic white (NBNHW) the reference group, native-born non-Hispanic black (NBNHB), native-born Hispanic (NBH), and foreign-born Hispanic (FBH). Additionally, to examine acculturation we separate foreign-born mothers by U.S. duration into two groups: less than 10 years and 10 or more years. We focus on mothers instead of fathers because mothers are often primarily responsible for the feeding and caretaking of children and are overwhelmingly the respondent to the parent survey. By restricting the sample to biological mothers, we ensure that changes in the assessment of child health are not due to different people assessing the child's health. Additionally, we examined other indicators of acculturation including English language ability and mother's age-at-arrival and alternate specifications for length of duration. The findings are substantively similar regardless of the measure of acculturation used.

Control variables associated with child health include demographic (child's age and gender), socioeconomic status (a composite measure of family socioeconomic status, number of siblings, and food security), family characteristics (mother's age, marital status, employment status, and the child's care arrangements), and access to care (time since last routine doctor's visit, which may include immunizations and check-ups and whether the child is covered by health insurance, either public or private). Gender is time-constant. Socioeconomic status was not measured in first grade and child care arrangements are not

asked in eighth grade. In these instances the variable is lagged and represents the response from the previous survey. Means and percentages of the study variables by mother's ethnicity/nativity are presented in Table 1.

Data Analysis

We begin by examining the percentage of children with excellent MRCH by the indicators of child health and by mother's ethnicity/nativity. Additionally, we assessed whether the association between that health condition and excellent MRCH varied by mother's ethnicity/nativity by including interaction terms and examining whether any interaction terms are significant or whether model fit improves. These analyses allow us to examine whether foreign-born Hispanic mothers assess their child's health differently than other mothers on other indicators of child health or whether child obesity operates differently than other health outcomes. Next, we utilize nested general linear mixed modeling with a binary distribution, which accounts for the longitudinal data and allows for a random intercept for each individual. Change over time is accounted for by including children's age in months. Model 1 contains the focal independent variables: mother's ethnicity/nativity and child obesity as well as the child's age and gender. The second model includes the additional controls: socioeconomic characteristics, family characteristics, the other indicators of child health, and access to care. The final model includes the interaction between mother's ethnicity/nativity and child obesity. This model allows us to examine whether Hispanic foreign-born mothers are more likely to rate their obese child as having excellent health compared to native-born Hispanic, non-Hispanic white, and non-Hispanic black mothers. Additional analyses tested for statistically significant differences among Hispanics by nativity and acculturation by changing the reference group. All analyses are weighted using normalized cross-sectional weights. The cross-sectional weights are used rather than the longitudinal weights because the longitudinal weights require that the child is present for all waves of data collection. Thus, we would have to exclude children who did not have valid responses to the study variables in all waves².

RESULTS

Table 2 presents the percentage of children with excellent MRCH by all child health indicators and by mother's race/ethnicity and nativity. Additional analyses indicate that the only indicator of child health that varied by mother's ethnicity/nativity as a predictor of excellent MRCH is child obesity³. This finding highlights the idea that obesity may be a distinct health indicator that is viewed differently among FBH mothers. For all other health indicators FBH mothers were just as likely to respond to a child health indicator in their ratings of child health as native-born mothers. Examining obesity, we find that NBNHW and NBH mothers appear the most likely to associate child obesity with worse child health.

²Unfortunately, we cannot adjust our standard errors and consequently our significance tests to account for the clustering at the school or county level given the nature of analyses. We examined the sensitivity of our results to this omission by including a series of dummy variables that represent the clustering and stratification of the survey. These results produced nearly identical results. Additionally, the very low p-values on the variables of interest suggest that these coefficients would remain significant even if the standard errors are downwardly biased.

³Additional analyses examined whether interactions between child health condition and mother's ethnicity/nativity are significant in general linear mixed models that include the full set of covariates and a random intercept. Among the other indicators of child's health besides obesity, model fit did not improve and none of the interactions are significant.

Among NBNHW mothers, 60.2% of the non-obese are rated as having excellent health compared to 39.5% of the obese. Conversely, FBH mothers, especially the least acculturated, appear the least likely to associate child obesity with excellent child health. Indeed, FBH mothers who have been in the U.S. for less than 10 years appear to be slightly inclined to associate child obesity with better health, 34.8% of the non-obese and 36.4% of the obese have excellent MRCH.

Next, these patterns are examined using nested multivariate general linear mixed models. The odds ratios (OR) and 95% confidence intervals (CI) predicting excellent MRCH are presented in Table 3. Model 1 contains the demographic variables, mother's ethnicity/nativity, and child obesity. We find that children of FBH mothers are significantly less to have excellent MRCH compared to children of NBNHW women, especially among less acculturated mothers (OR: 0.23, CI: 0.18, 0.29 for mothers with less than 10 years U.S. duration and OR: 0.34, CI: 0.28, 0.41 for mothers with 10 or more years of U.S. duration). Additionally, children of NBNHB and NBH mothers are significantly less likely to report excellent child health relative to NBNHW mothers (OR: 0.38, CI: 0.33, 0.43 for NBNHB and OR: 0.54, CI: 0.45, 0.65 for NBH). Focusing on children of Hispanic mothers, we see that increasing acculturation is associated with a greater likelihood to rate their child's health as excellent. Post-estimation analyses indicates that children of NBH are the most likely to have excellent MRCH, followed by foreign-born mothers with 10 or more years of duration, and foreign-born mothers with 0–9 years of duration are the least likely to have excellent MRCH and these differences are statistically significant. Mothers with obese children are significantly less likely to rate their child's health as excellent compared to mothers with non-obese children (OR: 0.43, CI: 0.39, 0.48). Additionally, mothers are less likely to rate their sons' health as excellent compared to their daughters (OR: 0.87, CI: 0.80, 0.95).

Model 2 includes the other controls: socioeconomic characteristics, family characteristics, and other indicators of child health. Including these variables reduces the difference in the odds of excellent MRCH between children of NBNHW mothers and the other groups, though differences remain significant. Additionally, these variables slightly reduce the difference in the odds of excellent MRCH between obese and non-obese children. Examining the other indicators of child health, we find that disabled children, less active children, children with vision difficulties, and children born early term are less likely to have excellent MRCH. Moreover, high birth weight children are more likely to have excellent MRCH relative to normal birth weight. Among the controls, we find that family socioeconomic status, mother's age, and food security are significant and positively associated with the odds of excellent MRCH. Furthermore, children who receive relative care have lower odds of having excellent MRCH compared to children who received only parental care. Lastly, children with health insurance are more likely to have excellent MRCH.

Model 3 includes the interactions between mother's ethnicity/nativity and child obesity. Interactions of obesity with mother's ethnicity/nativity demonstrate that FBH mothers, especially the least acculturated, are more likely to rate their obese child as healthy compared to NBNHW mothers. Among the native-born groups, the influence does not vary across ethnicity. For ease of interpretations, Figure 1 predicts probability of excellent

MRCH by mother's ethnicity/nativity and child's obesity by using linear combinations of the conditional main effects and interactions. All continuous variables are set to the mean for the whole sample and the reference group is assumed for the categorical variables. Within ethnic/nativity groups, obese children are less likely to have excellent MRCH except among children of FBH mothers. Differences in MRCH by obesity among FBH mothers were virtually non-existent. This finding is especially true among FBH mothers with the least acculturation. Additional analyses indicate that obesity is not a significant predictor of excellent MRCH among children of either more or less acculturated FBH mothers (OR: 0.80, CI: 0.59, 1.08 and OR: 0.94 CI: 0.62, 1.43, respectively). Also, while FBH mothers are least likely to associate child obesity with child health compared to the three native born groups, the difference between children of FBH mothers by acculturation is not statistically significant (results not shown). Lastly, the ethnicity/nativity disparities in excellent MRCH are much larger among non-obese children than obese children.

DISCUSSION

We examined patterns of excellent MRCH and variations in MRCH by mother's ethnicity/nativity and indicators of child health, focusing on difference between NBNHW, NBNHB, NBH, and FBH mothers by acculturation. Our findings indicate that for indicators of child health, excellent MRCH only varies by mother's ethnicity/nativity for child obesity. Among FBH mothers, child obesity did not influence MRCH and this finding is especially true among less acculturated mothers. FBH mothers did not rate obese and non-obese children differently in their likelihood of having excellent health. However, among the other ethnic/nativity groups, mothers were less likely to rate obese children as having excellent health relative to mothers with non-obese children. This pattern held after accounting for differences in socioeconomic characteristics, family characteristics, other indicators of child health, and access to health care.

Past research has indicated that children of immigrants are more likely to be obese or overweight than children of natives, despite their more favorable early maternal health and health behaviors on factors associated with child obesity, including healthier birth weight, lower rates of pre-natal smoking, lower pre-pregnancy body weight status, and greater initiation and duration of breastfeeding (7, 8). The cultural orientations of immigrant mothers that promote better health and health behaviors among their children are often cited as contributing to their more favorable health. Yet, cultural orientations that are protective in the first year of life may give way to less healthful orientations concerning child's nutrition and appropriate body size in middle childhood (23, 25, 26). The results presented here suggest that FBH mothers do not associate their child's obesity with global ratings of their child's health. This finding may be due to cultural orientations that view heavier children as healthier. Or they might indicate the difficulty that foreign-born mothers face when identifying their obese children accurately. However, these findings should be interpreted carefully and do not suggest that immigrant mothers are solely responsible for the higher prevalence of obesity among their children. We suggest that along with other factors, such as disadvantaged neighborhoods and schools that have limited access to high quality, healthy food or limited opportunities to participate in physical activity, cultural orientations may be contributing to the higher prevalence of obesity observed among children of FBH

mothers. Interventions and preventions programs targeted at lowering obesity among this group must also recognize that obesity may not be seen as a pressing child health concern.

While this project is the first to use nationally representative, longitudinal data to examine the association between MRCH and child obesity by mother's race/ethnicity and nativity, it does have a few limitations. First, a sizeable percent of the study population is lost due to attrition and non-response. Unfortunately, questions related to mother's place of birth are only asked at the spring of first grade wave when roughly 85% of the original sample remains. Preliminary analyses suggest that this missingness is not significantly associated with the dependent variable once key covariates are included, hence multiple imputations is deemed an appropriate method (28, 29). Additionally, general linear mixed models use maximum likelihood estimation which allow for the inclusion of data points for all children when they were interviewed and does not require us to limit our sample to only children who were present in all the waves of the data. Lastly, the indicators of child health other than child obesity rely on mother's reports instead of clinical measures and are limited to only a few child health conditions. Thus, we also incorporate two measures of access to care. Access to care, including attending routine check-ups, is likely to increase knowledge of other health conditions not assessed here and increase the likelihood that mother's accurately report their child's health conditions. Children of immigrants, especially those of Hispanic origin, represent a large and growing segment of the U.S. population and are especially at risk for developing obesity (20). This research indicates that children of foreign-born Hispanic mothers are less likely to have excellent MRCH and that child obesity, an indicator of poor child health, is not associated with MRCH for this population. While past research has demonstrated that mothers in general are likely to underestimate the health risks associated with child obesity (23, 24), this underestimation appears to be especially true among foreign-born Hispanic mothers. Additionally, individuals are more likely to change health degrading behaviors if they connect those behaviors to poor health outcomes (31). Parents are responsible for the health and well-being of their children. Family health behaviors such as diet and physical activity may aid in preventing or intervening in childhood overweight, but require parents to recognize the health risks of obesity (22, 23, 32). Future interventions aimed at reducing child obesity among this population should also focus on educating mothers about the dangers of child obesity as well as recognizing when their child is obese.

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Figure 1. Predicted Probability Mother Rates Child's Health as Excellent by Mother's Ethnicity/nativity, and Child's Obese Status

* Significant difference between obese and not obese within mother's ethnicity/nativity

Table 1

Weighted Means and Percentage of the Study Variables by Mother's Race/Ethnicity and Nativity, Early Childhood Longitudinal Study Kindergarten Cohort, 1997–2007, Kindergarten, 1st, 3rd, 5th, and 8th Grade Waves

	NB non-Hispanic white	NB non-Hispanic black	NB Hispanic	FB Hispanic, U.S. < 10 yr	FB Hispanic, U.S. >= 10 yr	Total
Excellent health	57.2	43.1	46.8	39.4	35.2	52.7
Obese	9.9	17.9	12.3	24.8	23.5	11.9
Mother's ethnicity/nativity						
NB non-Hispanic white	100.0	---	---	---	---	70.1
NB non-Hispanic black	---	100.0	---	---	---	12.2
NB Hispanic	---	---	100.0	---	---	6.9
FB Hispanic, U.S. >= 10 yrs	---	---	---	100.0	---	6.4
FB Hispanic, U.S. < 10 years	---	---	---	---	100.0	4.5
Child's age	114.5	113.2	112.5	113.8	113.9	114.1
Child's gender						
Female	48.8	51.0	49.4	49.3	47.1	49.1
Male	51.2	49.0	50.6	50.7	52.9	50.9
Child health						
Obese	14.3	20.6	18.1	26.7	22.7	16.5
Activity level compared to peers						
Less active	6.8	6.7	5.9	8.5	7.0	6.8
About as active	48.4	47.4	50.0	57.3	57.3	49.3
Slightly more active	29.1	22.4	26.0	21.3	23.6	27.3
A lot more active	15.7	23.5	18.2	12.9	12.1	16.5
Disabled	19.6	14.7	20.7	13.8	10.9	18.3
Vision difficulty	16.3	16.8	18.2	13.8	14.5	16.3
Birth weight						
Low	6.5	14.1	9.0	6.1	8.4	7.7
Normal	80.3	79.0	82.7	83.7	80.3	80.5
High	13.2	6.9	8.3	10.2	11.3	11.8
Early/pre-term birth	18.4	19.9	17.8	15.4	15.1	18.3

	NB non-Hispanic white	NB non-Hispanic black	NB Hispanic	FB Hispanic, U.S. < 10 yr	FB Hispanic, U.S. ≥ 10 yr	Total
Socioeconomic and family controls						
Socioeconomic status	0.2	-0.4	-0.2	-0.5	-0.7	0.0
Number of siblings	1.4	1.7	1.6	1.8	1.8	1.5
Mother's age	37.5	33.9	34.4	37.4	33.5	36.6
Mother's marital status						
Single	4.9	39.1	13.3	12.0	10.9	10.3
Married	80.3	39.7	67.7	73.5	79.7	74.0
Divorced, separated or widowed	14.8	21.3	19.0	14.4	9.3	15.6
Mother's employment status						
Mother not employed	25.0	21.5	26.5	35.0	51.3	26.5
Works ≥ 35 hrs/wk	48.5	64.3	55.2	48.2	34.0	50.2
Works < 35 hrs/wk	26.5	14.3	18.3	16.8	14.6	23.3
Food secure	94.2	85.3	91.1	85.5	80.5	91.7
Child care						
Parental only	63.1	47.9	56.3	61.8	70.7	61.1
Relative	14.2	26.3	26.2	21.2	14.8	16.9
Non-relative	8.1	4.5	4.8	5.2	4.5	7.1
Center	13.0	19.1	11.7	9.6	8.8	13.2
Other	1.6	2.2	1.0	2.2	1.3	1.7
Access to care						
Last doctor's visit						
More than 2 years	50.4	56.6	55.6	53.0	51.0	51.7
Less than 6 months	36.9	33.2	31.1	30.0	30.0	35.3
6 months to 1 year	10.9	8.8	11.0	13.7	14.4	11.0
1 year to 2 years	1.8	1.4	2.3	3.4	4.6	2.0
Has health insurance						
Observations	34,113	5,738	3,177	3,136	2,650	48,814

Table 2

Percentage of Children with Excellent Mother's Rating of Child's Health by Child Health Indicator and Mother's Race/ethnicity and Nativity, Early Childhood Longitudinal Study Kindergarten Cohort, 1997–2007, Kindergarten, 1st, 3rd, 5th, and 8th Grade Waves

	<u>NB non-Hispanic white</u>	<u>NB non-Hispanic black</u>	<u>NB Hispanic</u>	<u>FB Hispanic, U.S. duration ≥ 10 yrs</u>	<u>FB Hispanic, U.S. duration < 10 yrs</u>
Not obese	60.2	44.6	50.3	40.1	34.8
Obese ^I	39.5	37.4	31.9	36.6	36.4
Activity level					
Less active	38.0	23.9	28.1	27.3	22.3
About as active	55.9	41.3	44.7	37.7	35.1
Slightly more active	60.5	48.3	54.1	40.5	36.3
A lot more active	63.7	47.3	48.9	51.0	40.7
Not disabled	59.0	44.3	50.4	39.6	36.9
Disabled	49.9	36.3	33.9	36.3	21.4
No vision difficulties	58.1	43.2	47.8	39.7	36.6
Has vision difficulties	52.5	42.4	42.8	35.6	26.6
Birth weight					
Low	53.5	39.9	45.5	29.0	38.7
Normal	57.1	44.2	46.2	40.1	34.6
High	59.7	37.4	55.6	37.8	36.4
Not early/pre-term	57.7	44.5	47.0	39.8	35.4
Early/pre-term	54.9	37.3	46.8	35.7	33.8

^IThe association between this child health indicator and mother's rating of excellent child health varied by mother's ethnicity/nativity

Table 3

General Linear Mixed Models Predicting Mother Rated Child's Health as Excellent, Early Childhood Longitudinal Study Kindergarten Cohort, 1997–2007, Kindergarten, 1st, 3rd, 5th, and 8th Grade Wave

	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	2.14	(1.91,2.39)	1.12	(0.76,1.65)	1.15	(0.78,1.69)
Child's age	1.00	(1.00,1.00)	1.00	(1.00,1.00)	1.00	(1.00,1.00)
Child's gender (Female)						
Male	0.87	(0.80,0.95)	0.86	(0.79,0.94)	0.86	(0.79,0.94)
Mother's race/ethnicity and nativity (Native born non-Hispanic white)						
Native born non-Hispanic black	0.38	(0.33,0.44)	0.59	(0.51,0.69)	0.58	(0.49,0.68)
Native born Hispanic	0.54	(0.45,0.65)	0.71	(0.60,0.85)	0.72	(0.59,0.87)
Foreign born Hispanic, U.S. duration 10 or more years	0.34	(0.28,0.41)	0.52	(0.43,0.64)	0.47	(0.38,0.58)
Foreign born Hispanic, U.S. duration 0–9 years	0.23	(0.19,0.29)	0.41	(0.33,0.52)	0.35	(0.28,0.45)
Child Obese	0.43	(0.39,0.48)	0.50	(0.45,0.55)	0.45	(0.40,0.51)
X Native born non-Hispanic black					1.15	(0.85,1.54)
X Native born Hispanic					0.97	(0.59,1.43)
X Foreign born Hispanic, U.S. duration 10 or more years					1.63	(1.14,2.33)
X Foreign born Hispanic, U.S. duration 0–9 years					2.08	(1.35,3.20)
Child Health						
Activity level						
Less active			0.35	(0.30,0.40)	0.35	(0.30,0.41)
About as active			0.65	(0.59,0.71)	0.65	(0.59,0.71)
(Slightly more active)			0.80	(0.73,0.88)	0.80	(0.73,0.88)
A lot more active						
Disabled			0.73	(0.67,0.80)	0.73	(0.67,0.80)
Vision difficulty			0.85	(0.77,0.95)	0.86	(0.77,0.95)
Birth weight						
Low			0.85	(0.70,1.02)	0.85	(0.70,1.02)

	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
(Normal)						
High			1.18	(1.03,1.36)	1.18	(1.03,1.36)
Early/pre-term			0.83	(0.73,0.94)	0.83	(0.73,0.94)
Socioeconomic and family characteristics						
Socioeconomic status			1.59	(1.49,1.70)	1.59	(1.49,1.70)
Number of siblings			1.02	(0.98,1.06)	1.02	(0.98,1.06)
Mother's age			1.01	(1.00,1.02)	1.01	(1.00,1.02)
Mother's marital status						
(Single)						
Married			1.10	(0.95,1.26)	1.09	(0.95,1.26)
Divorced, separated or widowed			1.06	(0.97,1.16)	0.94	(0.80,1.10)
Mother's employment status						
(Mother not employed)						
Works 35 or more hours a week			1.09	(1.00,1.20)	1.06	(0.97,1.16)
Works less than 35 hours a week			0.94	(0.81,1.10)	1.09	(0.99,1.20)
Food secure			1.52	(1.34,1.73)	1.52	(1.33,1.72)
Child care						
(Parental only)						
Relative			0.86	(0.78,0.94)	0.86	(0.78,0.94)
Non-relative			1.00	(0.88,1.14)	1.00	(0.88,1.14)
Center			0.95	(0.86,1.06)	0.95	(0.86,1.06)
Other			0.96	(0.75,1.23)	0.97	(0.76,1.24)
Access to health care						
Last routine doctor's visit						
More than 2 years						
Less than 6 months			0.82	(0.66,1.02)	0.82	(0.66,1.02)
6 months to 1 year			1.18	(0.95,1.46)	1.18	(0.95,1.47)
1 year to 2 years			1.20	(0.96,1.50)	1.20	(0.96,1.51)
Has health insurance			1.10	(1.00,1.22)	1.10	(1.00,1.22)
AIC	48,473.7		48,918.5		48,001.9	

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	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
BIC	48,657.9		49,014.2		48,252.5	

n=48,814