



Published in final edited form as:

*J Immigr Minor Health*. 2009 June ; 11(3): 158–167. doi:10.1007/s10903-007-9096-0.

## Maternal Employment and Overweight Among Hispanic Children of Immigrants and Children of Natives

**Elizabeth Baker,**

Department of Sociology and Population Research Institute, Pennsylvania State University, 211 Oswald Tower, University Park, PA 16802, USA

**Kelly Stamper Balistreri, and**

Department of Sociology and Center for Family and Demographic Research, Bowling Green State University, Bowling Green, OH, USA

**Jennifer Van Hook**

Department of Sociology and Population Research Institute, Pennsylvania State University, 211 Oswald Tower, University Park, PA 16802, USA

Elizabeth Baker: ehb113@psu.edu

### Abstract

This research examines the relationship between maternal employment and child overweight among fifth grade Hispanic and non-Hispanic white children. Data from the Early Childhood Longitudinal Study Kindergarten (ECLS-K) cohort fifth grade sample (N = 4,360) were analyzed. OLS regression models were estimated predicting percentile BMI as a function of maternal employment, ethnicity, parental nativity status, income, and the interactions of employment, ethnicity/nativity, and income. Among Hispanic children of immigrants, maternal employment is associated with lower percentile BMI and this association strengthens at higher levels of income. Among Hispanic children of natives and non-Hispanic whites, maternal employment is beneficial (i.e. associated with lower percentile BMI) among low-income children but detrimental among high-income children, but this pattern is significantly greater in strength for Hispanics than non-Hispanic whites. Thus, maternal employment is associated with worse health outcomes only in the case of Hispanic children of natives, and maternal employment is associated with the best outcomes for Hispanic children of mothers from high-income families. We speculate that among children of immigrants, maternal employment may signify and/or accelerate assimilation towards middle- or upper-class American values of healthy weight and body size. Diet, meal regularity and supervision, and childcare did not mediate the relationship between maternal employment and overweight.

### Keywords

Hispanic; Children; Overweight; Immigrant; Maternal employment

---

## Introduction

Research on Hispanic and minority health has focused on what has been termed the “epidemiological paradox,” in which Hispanics (particularly immigrants) experience better health outcomes than would be expected given their relatively low socioeconomic status [1–3]. However much of this work has focused on infant [1, 4] and adult mortality [1, 3] or to some degree on adult health [5], and relatively little on child health [6, 7], and this work has tended to assume that socioeconomic status operates uniformly on health across all groups. In this paper, we explore generational differences in an important indicator of children’s health, specifically body mass index. The health advantage among Hispanics does not appear to extend to overweight, particularly among US-born natives. Hispanics suffer from particularly high levels of overweight and increased adiposity [8–12]. For example, among children 27% of boys and 20% of girls ages 6–11 of Mexican decent were overweight in 1999–2000, compared with 12% of non-Hispanic white boys and girls [9]. Nevertheless, consistent with the prior literature on nativity differences in health, overweight among Hispanics appears to be more prevalent among natives than immigrants, particularly among adolescents [9, 12] and adults [13]. These findings highlight the possibility that exposure to US lifestyles may be associated with less healthful diets, less physical activity, and weight gain [12, 14].

The family contexts associated with generational differences in children’s health behaviors and outcomes have not been adequately studied. In this paper, we explore the association of maternal employment with child health behaviors (nutrition and physical activity) and outcomes (percentile BMI) among Hispanic children of natives, Hispanic children of immigrants and non-Hispanic white children. We use data from a nationally-representative sample of children in middle childhood—the Early Childhood Longitudinal Study, Kindergarten cohort—to examine the relationship between maternal employment and overweight among children by ethnicity and nativity status. We explore whether the relationship between maternal employment and percentile BMI is stronger (or weaker) for Hispanic children of immigrants than Hispanic children of natives and the relative differences compared to native non-Hispanic white children. This study adds to the previous literature in three key ways. First, we include generational status when examining the relationship between maternal employment and percentile BMI for Hispanic children. Second, we assessed whether the relationship between maternal employment and child percentile BMI is mediated by diet, meal supervision and regularity, and childcare arrangements. Third, we examine the moderating effects of family income. This is important because much of the empirical work investigating the epidemiological paradox examines mortality or health differences while controlling for SES but fails to consider the possibility that the SES gradient differs across groups.

### **Generational Differences in the Association of Maternal Employment, and Child Overweight**

Anderson et al. [15] found a significant and positive association between the odds of child overweight and fulltime maternal employment, defined as working 35 h or more a week, in their study of non-Hispanic whites and minorities. However, upon closer examination this relationship was found to be significant only among white children, children with higher family incomes, and children whose mothers have higher education. They did not find a significant association among Hispanics. Kagamimori et al. [16] also found a positive relationship between maternal employment and overweight for a sample of Japanese preschool children. Differences in regularity of snacks and non-parental care appeared to account for this relationship. Yet no study has rigorously examined the relationship between maternal employment and child overweight for Hispanics, let alone whether the relationship varies by generational status.

The association between Hispanic mother's employment and child overweight may in fact differ by generational status. We suggest that maternal employment may have counterbalancing effects on children's weight status and the relative balance of the positive and negative effects are likely to vary across groups. On the positive side, maternal employment increases family income and provides more resources for the children. On the negative side, maternal employment may lead to less meal supervision and regularity, changes in diet, and more non-parental care.

Patterns of employment for Hispanic mothers differ from non-Hispanic white mothers and among Hispanic mothers, employment varies by generational status and acculturation. Among immigrants, more acculturated and English proficient Hispanic women have higher rates of employment than other Hispanic women [17–19], suggesting that employment is associated with greater acceptance of American lifestyles. Employment may also accelerate nutritional assimilation towards US diets, such as increased intake in processed and sugary foods, although it is important to keep in mind that the relationship between acculturation and overweight is not well established. For example, Ariza et al. [14] found no significant relationship between acculturation and overweight risk factors among Hispanic children ages 5 and 6. Similarly, in some studies of adults, less acculturated persons appear to be more likely to be overweight. Spanish speakers are more likely to be overweight than English speakers among Hispanic women in general [11], and within the second generation in particular [20]. Further evidence suggests that among overweight women, less acculturated women are less likely to view their weight as a health problem than more acculturated women [21].

Maternal employment may be more detrimental for Hispanic children of immigrants than Hispanic children of natives because the costs associated with maternal employment (such as decreased parental supervision or fewer home-cooked meals) may be greater, while the benefits of increased resources may be less. The payoff associated with maternal employment (i.e., increased family income) may be less for Hispanic children of immigrants because the type of employment in which immigrant mothers are engaged may not provide the same increases in income as native-born mothers. Hispanic foreign-born women are more likely to be employed in unskilled or semi-skilled professions or the worst and lowest paying factory jobs [22]. Although earnings tend to increase with time spent in the United States to the point that they converge with those of natives, there still remains a substantial gap in earnings between foreign-born Hispanic women and native-born Hispanic and non-Hispanic white women [23]. In addition, Hispanic immigrant women are more likely to work when their husbands' earnings are low to help bolster family income [24], suggesting that maternal employment may actually be associated with lower family income.

However, this argument assumes a negative relationship between family income and child overweight. All other things equal, maternal employment is positively associated with family income, and the relationship between income and overweight among children is strong and negative for non-Hispanic whites [25–27]. But for Mexican American youths, the association between SES and overweight is not clear [25]. Among Hispanic children of immigrants, the relationship between income and overweight is positive, although the odds of overweight tend to level off at average income and even decrease at higher levels [28]. Maternal employment among children of immigrants may be especially detrimental if higher family income does not compensate for (and may add to) the potential drawbacks associated with reduced parental supervision.

These ideas suggest that the effects of maternal employment may vary by family income. On the one hand, some research suggests that intensity of maternal employment is more detrimental for children (i.e., increasing the odds of being overweight) with more resources

[15, 29]. One possible explanation for this is that additional income brought about by mothers' employment may be proportionately larger for poor families than higher income families. Thus for poor families, the benefits of additional income may be more likely to outweigh the costs associated with reduced parental supervision. On the other hand, maternal employment may be more detrimental for lower-income families who may not have the resources to compensate for reductions in parental supervision. Thus, we will explore the effect of maternal employment on percentile BMI as a function of income and whether this relationship differs for Hispanic children of immigrants and Hispanic children of natives compared to non-Hispanic white children.

### **Mechanisms linking Maternal Employment and Overweight**

Maternal employment may lead to changes in diet and activity for children and this may be especially true for immigrants. Prior research has suggested that immigrants tend to change their diet with time spent in the United States, increasing their consumption of high calorie foods such as soft drinks, processed foods, and meats while also lowering their pre-migration intake of vegetables [30, 31]. Changes such as these are associated with an increased likelihood of overweight among adults. In addition, research on adolescents has found that differences in diet and physical activity between Hispanic children of immigrants and Hispanic children of natives accounts for the greater adiposity of children of natives [12]. Some explanations for such changes in dietary choices concern the cost of food, availability, and preferences of children [30]. Immigrant women's employment may increase exposure to American lifestyles concerning diet and physical activity, which would also affect their children.

Maternal employment may also be associated with higher percentile BMI because of a decrease in the time available for parental supervision and care. Children who are left unsupervised may make poor decisions concerning food choices, whereas having meals as a family may increase parental supervision over food choices and proportions. Therefore, children who eat meals with their parents are less likely to be overweight than children who do not have family structured eating times. Also, irregular eating habits, such as irregular snack times or skipping breakfast, are associated with higher propensity for overweight [16, 32]. In their study of Japanese preschool children, Kagamimori et al. [16] concluded that the relationship between maternal employment and child overweight operated primarily through irregular snack times, decreased sleep time, and non-maternal care, which they all found to be significantly related to overweight.

### **Hypotheses**

We offer a series of competing hypotheses not only to assess the relationship between maternal employment and adiposity in children, but also to examine the variation in this relationship across groups.

**No Difference Hypothesis**—The effect of maternal employment on percentile BMI does not vary by ethnicity or nativity status.

**Negative Assimilation Hypothesis**—Maternal employment is more harmful for Hispanic children of immigrants than children of natives. Immigrant children whose mothers work are doubly disadvantaged. Maternal employment may represent greater acculturation toward (unhealthy) US lifestyles and also decrease parental supervision and the number of home-cooked meals. Thus, the relationship of maternal employment and percentile BMI is expected to be more positive among Hispanic children of immigrants than Hispanic children of natives or non-Hispanic white children.

**Mixed Assimilation Hypothesis**—The effect of maternal employment for Hispanic children varies by income. Employed mothers assimilate more toward American lifestyles than do non-employed mothers. Among the employed, those with lower incomes assimilate more toward the low-income culture, which is characterized by a high prevalence of child overweight. Those with higher family incomes assimilate more toward the high-income culture in which child overweight prevalence rates are the lowest. Thus, among children of immigrants maternal employment is predicted to be associated with higher percentile BMI in children at low-income levels, but lower percentile BMI at high-income levels.

## Methods

### Data

To test the hypotheses listed above we use the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (ECLS-K). The ECLS-K is a longitudinal study conducted by the National Center for Education Statistics that follows a nationally representative sample of children from kindergarten through fifth grade. Information on children is collected from parents, teachers, school administrators, and the children themselves. In this project we use the fifth grade sample because most are fifth graders (around age 10) and may be viewed as old enough to be left home alone. This sample also provides additional nutrition information including a child food consumption questionnaire, allowing us to examine nutritional differences between children whose mothers work and children whose mothers do not work.

The final analytic sample includes 6,430 children (1,121 Hispanic children of immigrants and 496 Hispanic children of natives, and 4,813 non-Hispanic white children). This sample is restricted to children who have a valid BMI score, complete parental immigration information, and complete information on mother's employment on four waves of the survey (10,966 were in the sample before restrictions). To compensate for the multi-stage sampling design of ECLS-K, we use the child assessment weights provided by the NCES.

### Dependent Variable

**Percentile BMI**—To assess the adiposity of the child we use body mass index (BMI) percentile. Height is measured using a Shorr board and weight is measured using a digital bathroom scale. BMI is calculated as weight/height<sup>2</sup>, and converted to a percentile score within gender and age groups using CDC guidelines. Percentile BMI is an optimal measure for children because it accounts for variation in height and weight by gender and age (months).

### Focal Independent Variables

**Maternal Employment**—Maternal employment is measured with a dichotomous variable indicating whether or not the mother was employed for 35 h or more per week for all six waves of the survey. Missing values were an issue with this measure. However, there was little variation in maternal employment among the respondents across the different waves of the survey. Therefore, if there was only one missing value for maternal employment across the six waves and the mother indicated that they had been employed full-time across the other waves, we assume that they also worked full-time in the wave with the missing information.<sup>1</sup>

<sup>2</sup>Prior analyses included mother's education in the model. Including this variable did not change our results, therefore it is left out of the models presented in this paper.

<sup>1</sup>Data limitations do not allow us to measure weekly employment hours continuously. While this question was asked the data only provides four possible responses, 35 h or more, less than 35 h, looking for work, and not in the labor force.

**Ethnicity/Nativity Status**—Hispanic ethnicity is coded one if the parent reports a child as having Hispanic ethnicity, and zero otherwise. Children with at least one immigrant parent are coded as one (zero otherwise). The immigrant status of the parent is determined by their response to country of birth on the parent questionnaire. For the purpose of these analyses, parents born in Puerto Rico are considered foreign born because as migrants they may undergo the same kind of cultural change as immigrants. We create two dummy variables to define three mutually exclusive nativity and ethnic categories: Hispanic children of immigrants and Hispanic children of natives, with non-Hispanic white children of natives as the reference group.

**Family Income**—Family income is constructed from parents' reports. In the fifth grade wave this variable is recorded categorically rather than continuously. Examining income over time shows very little variation in income within subjects. Therefore, we used base year (kindergarten) income divided by 1,000 (i.e., income is measured in \$1,000 s).

**Interactions**—To test whether maternal employment is moderated by ethnicity/nativity status and whether the effect of maternal employment varies by income, we test the significance of several interaction terms in the models, including: two-way interactions of maternal employment by generational status, income by generational status, and income by employment. To test whether the interacting effects of maternal employment and income vary by nativity status relative to non-Hispanic whites, we test the significance of a three-way interaction terms among employment, income, and generational status.

## Mechanisms

**Child's Food Consumption**—Information about the child's nutrition was gathered with a questionnaire the child completed with the assistance of an interviewer. We create a vegetable consumption scale by summing together the separate responses of how many days in the past week the child ate green salad, carrots, or other vegetables. Soda consumption is measured as the number of days in the past week the child consumed soda; 0 = never and 7 = everyday.

**Meal Supervision and Regularity**—Parents were asked to indicate the number of days a week the child experienced the following: "At least some of the family eats breakfast together," "Child has breakfast at a regular time," "Your family eats the evening meal together," and "Child has evening meal at a regular time." These variables are used in the analyses in their original form.

**TV Viewing**—Data on TV viewing is obtained from the parent's report of time that the child spends watching television before school, after school, and on the weekends. This index measures the hours a week that a child watches TV, if there is no TV in the home the variable is coded as 0.

**Childcare Arrangements**—Childcare arrangements are represented by a series of dichotomous variables representing the regular arrangements for the child's care after or before school. These categories are parental care (reference group), relative care, non-relative care, and center based care. These variables are not mutually exclusive because parents can have multiple childcare arrangements.

## Controls

**Gender**—Prevalence of overweight varies by gender, with boys more likely to be overweight than girls. Gender of the child is obtained from school records and verified by the parent, females = 1 and males = 0.



**Number of Siblings**—This index measures the number of siblings the child has in her/his home and ranges from 0 to 8. The amount of maternal time available to a child as well as resources varies by number of siblings.

**Single Parent**—Maternal employment and time available varies by family structure. Whether the child lives with a single parent is determined by parental report. If the child lives most often with only a mother or mother figure then single parent = 1 (otherwise single parent = 0).

**Paternal Employment**—Hispanic mothers employment decisions are affected by their spouse's employment. Also paternal employment may affect the resources available to a child. Data on father's employment come from the parent's questionnaire for the fifth grade wave. If the child's father or father figure was working 35 hours or more per week in the fifth grade survey, then father full-time = 1 (zero otherwise).

### Analytic Strategy

To test the hypotheses we estimate nested OLS regression models. The first model estimates percentile BMI as a function of maternal employment, parental immigrant status, ethnicity, family income, and controls.<sup>2</sup> This model thus estimates the relationship between maternal employment, immigrant status, ethnicity, and percentile BMI net of possible mechanisms. The second model adds interaction terms to determine whether the effect of maternal employment on child percentile BMI is a function of income and whether nativity status and ethnicity moderates this effect (we tested the two-way interactions first, then add the three-way interactions). The last model adds the potential mechanisms, diet, meal supervision and regularity, and childcare, to examine whether these measures explain the relationship between maternal employment and overweight for children.

### Results

Table 1 presents the means and standard deviations of the dependent and independent variables separately by parental immigration status and ethnicity. Consistent with other research, Hispanic immigrant mothers have significantly lower levels of full-time employment than Hispanic natives and non-Hispanic whites. Hispanic children, regardless of parental nativity status, have higher percentile BMI and lower family income, than do non-Hispanic white children. Examining behaviors, non-Hispanic white children are significantly more likely to have a regular breakfast time than Hispanic children. Hispanic children of immigrants are more likely to have a regular dinner time than Hispanic children of natives or non-Hispanic whites. Hispanic children of natives watch significantly more television than Hispanic children of immigrants or non-Hispanic whites. Also, non-Hispanic white children consume less soda than Hispanic children.

Table 2 presents the results of the OLS regression models. As shown in Model 1, maternal employment is not significantly related to percentile BMI, net of Hispanic ethnicity, parental immigration status and basic controls. Prior analyses that did not include a measure of maternal employment showed that the effects of ethnicity and parental immigrant status were primarily unchanged by its inclusion. Model 1 also indicated that Hispanic children of immigrants have significantly higher percentile BMI than non-Hispanic white children, but not Hispanic children of natives. The relationship of family income with percentile BMI is significant and negative, indicating that higher income is associated with lower percentile BMI. Model 1 does not support our hypothesis that maternal employment is associated with percentile BMI either positively or negatively. However, there may be important differences that exist between the children of natives and children of immigrants and between children

from low versus high-income households. To test for this we include interactions of parental immigrant status, maternal employment, and income.

Hypothesis 2, or the Negative Assimilation Hypothesis, predicted that maternal employment may be more harmful for Hispanic children of immigrants compared to Hispanic children of natives. Model 2 includes two-way interactions between parental nativity status, maternal employment, and family income. The coefficient for the interaction between children of Hispanic immigrant and maternal employment is positive and the coefficient for the term between Hispanic native and employment is negative suggesting that maternal employment may be more detrimental for children of immigrants, but the coefficients fail to reach significance. Therefore, Hypothesis 2 is not supported. However, the coefficient of the interaction between employment and income is marginally significant and positive ( $P = 0.06$ ). This suggests that among non-Hispanic white children whose mothers work intensely higher income is associated with higher percentile BMI. This trend is well documented in the literature for native non-Hispanic white children [12, 28]. In addition, family income is negatively associated with percentile BMI for non-Hispanic white children whose mothers did not work continuously during middle childhood, as shown by the significant negative coefficient for main effect of income.

Hypothesis 3, the mixed assimilation hypothesis, states that the interactive effect of income and maternal employment may differ by Hispanic ethnicity and parental nativity status. Model 3 includes the three-way interaction terms between income, maternal employment, and parental nativity status. The addition of the set of three way interaction terms is significant ( $P = 0.01$ ). Because of the difficulty interpreting the three-way interaction effects, we present the results graphically in Fig. 1. Figure 1 shows the predicted relationship of maternal employment by parental nativity status, ethnicity, and income, based on Model 4. In this graph income is represented by three values low (\$20,000), middle (\$40,000), and high (\$60,000). Among Hispanic children of immigrants, maternal employment is associated with lower percentile BMI and this relationship is stronger at higher income levels. This result suggests that among Hispanic children of immigrants maternal employment protects children from weight gain rather than promotes it. However, this relationship is only marginally significant among high-income children ( $P = 0.08$ ). Among Hispanic children of natives the opposite relationship emerges. At low levels of income, maternal employment is beneficial. However, among high-income children, intensity in maternal employment is associated with higher percentile BMI compared to non-intense/no maternal employment. Further analyses (not shown) indicate that the relationship between maternal employment and income differs significantly for Hispanic children of natives compared to Hispanic children of immigrants ( $P = 0.02$ ). For non-Hispanic white children, the pattern of maternal employment and income on percentile BMI mirrors that found for Hispanic children of natives in that maternal employment is associated with higher percentile BMI among children with higher incomes. However, this effect is even stronger for Hispanic children of natives compared to non-Hispanic whites. For non-Hispanic whites, the effect of maternal employment on percentile BMI is only significant for high-income children (analyses not shown).

Model 4 adds potential mechanisms to the model, including indicators of diet, meal supervision and regularity, and child care arrangements. These variables significantly improve the model fit ( $P < 0.001$ ). Variables representing activity and meal supervision and regularity are significantly associated with percentile BMI. TV viewing is significantly, positively associated with percentile BMI. Also, having breakfast at a regular time is negatively associated with BMI percentile. However, the mechanisms fail to mediate the effects of maternal employment.



## Summary

The effect of maternal employment on percentile BMI varies by family income, Hispanic ethnicity, and nativity status for the ECLS-K sample of fifth graders. Of the hypotheses posed in this paper, our results show the most support for the mixed assimilation hypothesis. The interactive effects of maternal employment with income on percentile BMI are significant and this relationship is virtually the opposite for children of immigrants compared to children of natives ( $P < 0.05$ ). Among high-income children maternal employment appears to protect Hispanic children of immigrants from overweight, but promotes it (slightly) among Hispanic children of natives and non-Hispanic whites. However, among low-income children maternal employment is especially beneficial for Hispanic children of natives, at least with regard to body weight. The association of maternal employment and income with percentile BMI is similar for Hispanic children of natives and non-Hispanic whites, but the strength of the relationship is significantly greater for Hispanic children of natives. The mechanisms significantly improve the model fit, but did not mediate the effects of maternal employment.

## Discussion

To our knowledge, this is the first paper to examine the association of maternal employment with BMI by nativity status for a nationally representative sample of young children. Of our competing hypotheses, the results best support the mixed assimilation hypothesis. According to this hypothesis, maternal employment would be associated with lower percentile BMI for Hispanic children of immigrants with higher incomes, while the interactive relationship of maternal employment with income for Hispanic children of natives would be similar to that found for non-Hispanic whites. Indeed, our findings suggest that full-time maternal employment is associated with lower percentile BMI for Hispanic children of immigrants, especially among high-income children. Prior research, not controlling for nativity status, finds the opposite interactive effect of maternal employment and income on the odds of overweight [15, 29]. Perhaps immigrant women's employment has positive effects on children's health (particularly at higher incomes) because immigrant mother's experiences at work spill over into the home in ways that benefit children. One possibility is that maternal employment accelerates—or at least is associated with—Americanized ideals of appropriate body size. Hispanics often are less likely than non-Hispanic whites to recognize overweight in their children [14]. Acculturation on the part of both the mother and child is associated with perceiving thinner images as ideal over fatter images [31]. On the other hand, children of immigrants whose mothers do not work intensely may be less acculturated. This could suggest that mother's experiences outside the home are particularly important for children's dietary assimilation—at least in middle childhood.

The pattern found for non-Hispanic white children in the present study is similar to that found in previous studies that examined child outcomes [15, 29, 33]; maternal employment is associated with better health outcomes for low-income children and worse outcomes for high-income children. However, previous studies have failed to find a significant association between maternal employment and overweight for Hispanic children. The findings presented in this study suggest that this may be due to research designs that fail to examine the nativity status of Hispanic parents. Indeed, after separating Hispanic children by the nativity status of their parents, the interactive effect of maternal employment and income on percentile BMI is even stronger for Hispanic children of natives compared to non-Hispanic whites. This suggests that maternal employment may be particularly beneficial for low-income Hispanic children of natives. Perhaps, facilitating employment among low-income Hispanic native mothers may help reduce child overweight for this specific sub-group.

We note several limitations of the research presented here. First, it would have been preferable to utilize a continuous measure of maternal employment in hours worked per week and weeks worked per year. In addition, it is unclear the extent to which our measure of employment captures sporadic or informal types of work that tends to be more common among immigrant women. However, the ECLS-K data provide information only on whether the mother worked full-time, part-time or not at all when the survey was administered. Second, none of the variables we identified as potential mechanisms for body weight and maternal employment appear to explain the relationship between maternal employment and percentile BMI. This may have not occurred if more detailed measures of diet and physical activity were used, such as frequency of more traditional Hispanic foods compared to more Americanized foods or measures of the frequency of snacking/eating. Also, the child's consumption habits were only assessed in the final wave. Last, the data do not provide a way to determine the legal status of the immigrant parents. Legal status may affect resources, type of employment, and health [34, 35], and unauthorized immigrants are overwhelmingly Hispanics (78% in 2005) [36]. Unauthorized immigrant women earn considerably less, are overrepresented in the service sector, and have lower labor force participation rates than their authorized and native counterparts [36]. Greater stress associated with being unauthorized along with lower incomes may promote overweight in children. However, greater isolation and less acculturation [34, 36] may protect children from adopting potentially poor Americanized health habits, such as eating sugary processed foods and sedentary lifestyles.

Given that Hispanics now represent nearly 20% of children in the United States [37], it is important to understand the factors that influence overweight and obesity in this population. Further research that explores the effects of shifting dietary practices among Hispanic immigrant families relative to Hispanic native families could provide an additional insight into the relationship between maternal employment and children's BMI.

## Acknowledgments

This research was supported by a Young Scholars grant provided by the Foundation for Child Development and The Center for Family and Demographic Research at Bowling Green State University which has core funding from the National Institute of Child Health and Human Development (R24HD050959-01).

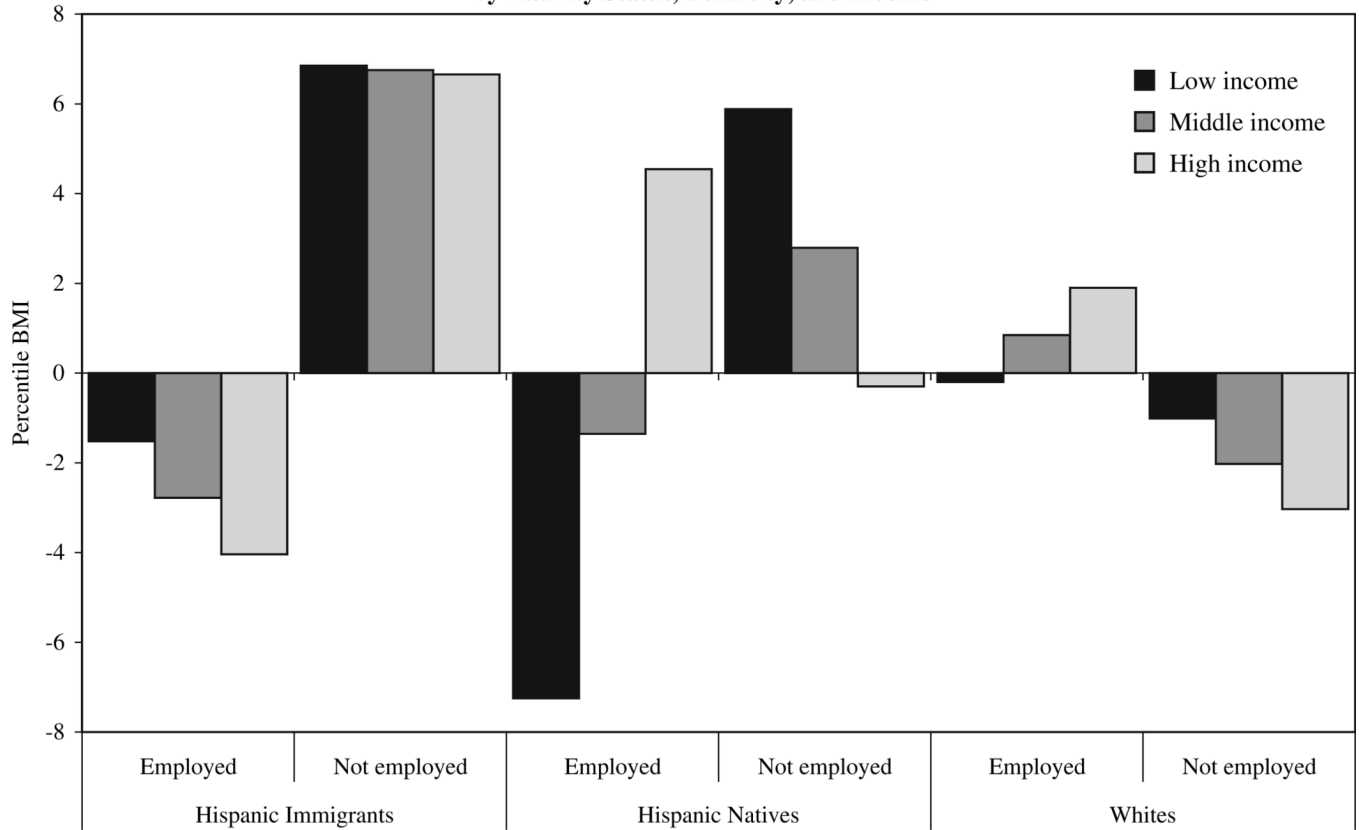
## References

1. Markies K, Coreil J. The Health of Hispanics in the Southwestern United States: an epidemiological paradox. *Public Health Rep.* 1986; 101(3):253–265. [PubMed: 3086917]
2. Elo, IT.; Preston, SH. Racial and ethnic differences in mortality at older ages. In: Martin, LG.; Soldo, BJ., editors. *Racial and ethnic differences in the health of older Americans.* Washington, DC: National Academy Press; 1997. p. 10-42.
3. Abraído-Lanza A, Dohrenwend BP, Ng-Mak DS, Turner JB. The latino mortality paradox: a test of the salmon bias and healthy migrant hypotheses. *Am J Public Health.* 1999; 89(10):1543–1548. [PubMed: 10511837]
4. Landale NS, Oropesa RS, Gorman BK. Migration and infant death: assimilation or selective migration among puerto ricans? *Am Sociol Rev.* 2000; 65(6):808–899.
5. Cho Y, Frisbie WP, Rogers RG. Nativity, duration of residence, and the health of Hispanic adults in the United States. *Int Migr Rev.* 2004; 38(1):184–211.
6. Mendoza FS. The health of Latino children in the United States. *Future Child.* 1994; 4(3):43–72. [PubMed: 7859043]
7. Zambrana RS, Logie LA. Latino child health: need for inclusion in the national discourse. *Am J Public Health.* 2000; 90(12):1827–1833. [PubMed: 11111250]

8. United States Department of Health and Human Services. Rockville, MD: United States Department of Health and Human Services, Public Health Service; 2001. The surgeon general's call to action to prevent and decrease overweight and obesity.
9. Popkin BM, Udry JR. Adolescent obesity increases significantly in second and third generation United States immigrants: the National Longitudinal Study of Adolescent Health. *J Nutr.* 1998; 128:701–706. [PubMed: 9521631]
10. Ogden CL, Troiano RP, Briefel RR, Kuczmarski RJ, Flegal KM, Johnson CL. Prevalence of overweight among preschool children in the United States, 1971 through 1994. *Pediatrics.* 1997; 99 Available <http://pediatrics.aappublications.org/cgi/content/full/99/4/e1>.
11. Kahn LK, Sobal J, Martorell R. Acculturation, socio-economic status and obesity in Mexican Americans, Cuban Americans, and Puerto Rico. *Int J Obes.* 1997; 21(2):91–96.
12. Gordon-Larson P, Harris Kathleen M, Ward Diane S, Popkin Barry M. Acculturation and overweight-related behavior among Hispanic immigrants to the United States: the National Longitudinal Study of Adolescent Health. *Soc Sci Med.* 2003; 57:2023–2034. [PubMed: 14512234]
13. Antecol H, Bedard K. Unhealthy assimilation: do immigrants converge to American health status levels? *Demography.* 2006; 43(2):337–360. [PubMed: 16889132]
14. Ariza AJ, Chen EH, Binns HJ, Christoffel KK. Risk factors for overweight in five- to six-year old Hispanic-American children: a pilot study. *J Urban Health.* 2004; 81(1):150–161. [PubMed: 15047793]
15. Anderson P, Butcher K, Levine P. Maternal employment and overweight. *J Heal Eco.* 2003; 22(3): 477–504.
16. Kagamimori S, Yamagami T, Sokejima S, Numata N, Handa K, Nanri S, Saito T, Tokui N, Yoshimura T, Yoshida K. The relationship between lifestyle, social characteristics and obesity in 3-year-old Japanese children. *Care Health Dev.* 1999; 25(3):235–248.
17. Boyd, M.; Grieco, E. Women and migration: incorporating gender into international migration theory. Washington DC: Migration Policy Institute; 2003. <http://www.migrationinformation.org/Feature/display.cfm?id=106>
18. Stier H, Tienda M. Family, work, and women: the labor supply of Hispanic immigrant wives. *Int Migr Rev.* 1992; 26(4):1291–1313.
19. Schoeni R. Labor market outcomes of immigrant women in the United States: 1970–1990. *Int Migr Rev.* 1998; 32(1):57–77. [PubMed: 12321472]
20. Sundquist J, Winkleby M. Country of birth, acculturation status and abdominal obesity in a national sample of Mexican–American women and men. *Int J Epidemiol.* 2000; 29(3):470–477. [PubMed: 10869319]
21. Arica E, Skinner M, Bailey D, Correa V. Models of acculturation and health behaviors among Latino immigrants to the US. *Soc Sci Med.* 2001; 53(1):41–53. [PubMed: 11386307]
22. Glenn NE. Racial ethnic women's labor: the intersection of race, gender, and class oppression. *Rev Radic Polit Econ.* 1985; 17(3):86–108.
23. Allensworth EM. Earnings mobility of first and 1.5 generation Mexican-origin women and men: a comparison with U.S.-Born Mexican Americans and Non-Hispanic Whites. *Int Migr Rev.* 1997; 31(2):386–410. [PubMed: 12292876]
24. Greenless CS, Saenz R. Determinants of employment of recently arrived Mexican immigrant wives. *Int Migr Rev.* 1999; 33(2):354–377. [PubMed: 12319735]
25. Wang Y, Zhang Q. Are American children and adolescents of low socioeconomic status at increased risk of obesity? Changes in the association between overweight and family income between 1971 and 2002. *Am J Clin Nut.* 2006; 84(4):707–716.
26. Chang VW, Lauderdale DS. Income disparities in body mass index and obesity in the United States, 1971–2002. *Arch Intern Med.* 2005; 165(18):2122–2128. [PubMed: 16217002]
27. Miech RA, Kumanyika SK, Stettler N, Link BG, Phelan JC, Chang VW. Trends in the association of poverty with overweight among US adolescents, 1971–2004. *JAMA.* 2006; 295:2385–2390. [PubMed: 16720824]

28. Van Hook J, Balistreri KS. Immigrant generation, socioeconomic status, and economic development of countries of origin: a longitudinal study of body mass index among children. *Soc Sci Med.* 2007; 65(5):976–989. [PubMed: 17570571]
29. Ruhm, CJ. [Accessed November 12, 2006] Maternal employment and adolescent development. NBER Working Paper Series, Vol. w10691. 2004. Available at SSRN: <http://ssrn.com/abstract=79222>
30. McArthur LH, Viramontez Anguiano RP, Nocetti D. Maintenance and change in the diet of hispanic immigrants in Eastern North Carolina. *Fam Consum Sci Res J.* 2001; 29(4):309–335.
31. Olvera N, Suminski R, Power TG. Intergenerational perceptions of body image in Hispanics: role of BMI, gender, and acculturation. *Obes Res.* 2005; 13:1970–1979. [PubMed: 16339129]
32. Ma Y, Bertone ER, Stanek EJ III, Reed GW, Hebert JR, Cohen NL, Merriam PA, Ockene IS. Association between eating patterns and obesity in a free-living US adult population. *Am J Epidemiol.* 2003; 158(1):85–92. [PubMed: 12835290]
33. Vandell DL, Ramanan J. Effects of early and recent maternal employment on children from low-income families. *Child Dev.* 1992; 63(4):938–949. [PubMed: 1505249]
34. Jasso G, Massey DS, Rosenzweig MR, Smith JP. The New Immigrant Survey Pilot(NIS-P): overview and new findings about U.S. Legal Immigrants at Admission. *Demography.* 2000; 37(1): 127–138. [PubMed: 10748994]
35. Kullgren JT. Restrictions on undocumented immigrants' access to health services: the public health implications of welfare reform. *Am J Public Health.* 2003; 93(10):1630–1633. [PubMed: 14534212]
36. Passel JS. The size and characteristics of the unauthorized migrant population in the US; estimates based on the March 2005 CPS. Pew Hispanic Center. 2006 [http://extras.mnginteractive.com/live/media/site200/2006/0307/20060307\\_062949\\_pew\\_030806.pdf](http://extras.mnginteractive.com/live/media/site200/2006/0307/20060307_062949_pew_030806.pdf).
37. U.S. Census Bureau; Census 1990 & 2000. American Community Survey 2005; generated by Kelly Balistreri; using American Factfinder. 2007 March 12. <http://factfinder.census.gov/>

**Total Effects of Maternal Employment on BMI Percentile by Nativity Status, Ethnicity, and Income**



**Fig. 1.** Total effects of maternal employment on BMI percentile by nativity status, ethnicity, and income

Table 1

Weighted means of project variables by maternal employment and parental nativity status

	Hispanic child of immigrant <sup>a</sup> (n = 1,121)	Hispanic child of native <sup>b</sup> (n = 496)	Non-Hispanic white children <sup>c</sup> (n = 4,813)
Percentile BMI	73.104	69.812 <sup>†</sup>	64.777 <sup>***</sup>
Maternal Employment (full time)	0.240	0.315	0.293 <sup>*</sup>
Family income (in 1,000 s)	29.420 <sup>***</sup>	41.374 <sup>***</sup>	60.734 <sup>***</sup>
<i>Controls</i>			
Single parent	0.154 <sup>***</sup>	0.366 <sup>***</sup>	0.166
Number of sibling	1.913	1.748 <sup>*</sup>	1.429 <sup>***</sup>
Female	0.485	0.524	0.484
Father employed full-time	0.729 <sup>***</sup>	0.574 <sup>***</sup>	0.764
<i>Activity</i>			
TV Viewing	119.666 <sup>*</sup>	135.695 <sup>*</sup>	122.854
<i>Child's Food Consumption</i>			
Soda (d/wk)	3.063	3.190 <sup>†</sup>	2.902 <sup>*</sup>
Vegetables (d/wk)	6.699	6.874	6.667
<i>Meal Supervision and Regularity</i>			
Family eats breakfast together (d/wk)	3.224	2.977 <sup>***</sup>	3.759 <sup>***</sup>
Regular breakfast time (d/wk)	5.069	4.886 <sup>*</sup>	5.270 <sup>**</sup>
Family eats dinner together (d/wk)	5.588	5.468	5.512
Regular dinner time (d/wk)	5.235 <sup>**</sup>	4.719	4.832 <sup>***</sup>
<i>Child Care Arrangements</i>			
Center care	0.114	0.129	0.130
Child cares for self	0.102	0.118	0.114
Relative care	0.194	0.198	0.208
Non-relative care	0.039	0.057	0.041

<sup>†</sup> Significant at  $P < 0.1$ ;<sup>\*</sup> significant at  $P < 0.05$ ;<sup>\*\*</sup> significant at  $P < 0.01$ ;<sup>\*\*\*</sup> significant at  $P < 0.001$ <sup>a</sup> Difference tests between Hispanic children of immigrants and Hispanic children of natives<sup>b</sup> Difference tests between Hispanic children of natives and non-Hispanic whites<sup>c</sup> Difference tests between Hispanic children of immigrants and non-Hispanic whites



Table 2

OLS regression results, BMI percentile among fifth grade Hispanic and non-Hispanic white children

	Model 1 ( $\beta$ )	Model 2 ( $\beta$ )	Model 3 ( $\beta$ )	Model 4 ( $\beta$ )
<i>Hispanic Immigrant</i>	6.177***	6.738**	6.516*	6.949**
× Family Income		-0.028	0.000	-0.005
× Maternal Employment		0.222	1.434	0.980
× Family Income × Maternal Employment			-0.070	-0.063
<i>Hispanic Native</i>	3.147	4.279	9.204†	8.974†
× Family Income		-0.014	-0.150†	-0.155†
× Maternal Employment		-0.183	-13.24†	-11.90
× Family Income × Maternal Employment			0.303*	0.295*
<i>Maternal Employment</i>				
Full-time <sup>d</sup>	1.381	-2.432	-1.047	-1.246
<i>Family income</i>	-0.057***	-0.069**	-0.064**	-0.051*
× Full-time		0.071†	0.047	0.052
<i>Activity</i>				
TV Viewing				0.023**
<i>Child's Food Consumption</i>				
Soda (d/wk)				-0.195
Vegetables (d/wk)				-0.117
<i>Meal supervision and regularity</i>				
Family eats breakfast together(d/wk)				0.050
Regular breakfast time (d/wk)				-0.859*
Family eats dinner together (d/wk)				0.694
Regular dinner time (d/wk)				0.292
<i>Child Care Arrangements</i>				
Center care				-1.306
Child cares for self				-1.291
Relative care				1.126
Non-relative care				2.574
Intercept	71.917***	72.434***	72.325***	68.803***
R <sup>2</sup>	0.026	0.028	0.030	0.039
$\Delta F$		2.641*	8.270***	6.602***

n = 6,430

†  $P < 0.10$ ;\*  $P < 0.05$ ;\*\*  $P < 0.01$ ;\*\*\*  $P < 0.001$ 

Models include controls for gender, family structure, number of siblings and father employment

<sup>a</sup>Reference category are employed less than full time or never employed