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Young Latino Children Obesity: The Importance of Socioeconomic Status, Home Language, TV Watching, and Physical Activity

Claudia L. Galindo, PhD[1] & Sergio I. Prada, MPA, PhD[2]

Abstract

The incidence of young Latino children obesity is a public health concern. Among 5-year-olds, 16% of Latinos are obese compared with 10% of whites. Obesity disparities between non-Latino white and Latino children increase significantly with age. The purpose of this study is to examine the importance of socioeconomic status (SES), home language, physical activity, and TV watching for explaining obesity disparities between 5-year-old white and Latino children. Also, the long-lasting influence of these four variables is studied by analyzing their impact on obesity as children grew to ages 6, 8, and 10. We used a nationally representative sample drawn from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) collected in 1998-99. Logistic regression models with adjusted standard errors for the complex sampling design and nested structure of the ECLS-K were estimated. Analyses were conducted in 2012. SES and home language were significantly associated with obesity after controlling for covariates. Similarly, physical activity had a negative association and TV watching has a positive association with obesity. When accounting for all four variables, obesity disparities between white and Latino children became statistically non-significant. All four factors had lasting effects on obesity even as children grew to ages 6, 8, and 10. Findings identified mechanisms to reduce young Latino children' obesity disparities. The benefits of these mechanisms persist throughout early adolescence, which is particularly important given the need to implement interventions with long term effects.

Keywords: Children obesity, Latinos, socioeconomic status, home language, physical activity.

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Obesidad en niños latinos: la importancia del estatus socioeconómico, el lenguaje en casa, consumo de televisión, y la actividad física.

Claudia L. Galindo, PhD[3] & Sergio I. Prada, MPA, PhD[4]

Resumen

La incidencia en la obesidad en niños jóvenes latinos es un problema de salud pública. Entre los niños de 5 años de edad, el 16% de los latinos son obesos en comparación con 10% de los blancos. Las brechas en la obesidad entre los niños no latinos y los blancos se incrementa significativamente con la edad. El propósito de este estudio es examinar la importancia del estatus socioeconómico (ESE), la lengua materna, la actividad física, y el consumo de televisión como explicación de las brechas de obesidad entre niños blancos de 5 años de edad y niños latinos. A su vez, la influencia de estas cuatro variables en el mediano plazo es estudiada analizando su impacto en la obesidad cuando los niños crecen a edades de los 6, 8 y 10 años. Usamos la muestra nacional representativa Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) tomada en 1998-99 en los Estados Unidos. Modelos de regresiones logísticas con errores estándares ajustados por el diseño complejo de muestreo y la estructura anidada de ECLS-K fueron estimados. Los análisis fueron hechos en 2012. Los resultados muestran que ESE y la lengua maternal están asociados significativamente con la obesidad tras controlar por otras variables. Similarmente, la actividad física tiene una asociación negativa y el ver televisión tiene una asociación positiva con la obesidad. Cuando incluimos las cuatro variables, la brecha en obesidad entre niños blancos y latinos se vuelve estadísticamente no significativa. Todos los cuatro factores tienen efectos duraderos en la obesidad cuando se observan a las edades de 6, 8 y 10 años. Los hallazgos identifican mecanismos para reducir la brecha de los niños jóvenes latinos. Los beneficios de esos mecanismos persisten a través de la temprana adolescencia, la cual es particularmente importante dada la necesidad de implementar intervenciones de largo plazo.

Keywords: Obesidad infantil, Latinos, estatus socioeconomico, lenguaje en casa, actividad física.

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CONTENIDO

1 Introduction

The progression of the obesity epidemic across different age groups in the United States has been well chronicled. In the past 30 years, obesity rates doubled from 5% to 10.4% for children ages 2-5, tripled from 6.5% to 19.6% for ages 6-11, and almost quadrupled from 5% to 18.1% for ages 12-19.[1] The incidence of obesity is even more alarming for racial/ethnic minority children, with blacks, Latina/os, and Native Americans showing the highest rates of weight problems.[2-7] Minority children's weight disadvantages are observed as early as the age of 5. At the start of kindergarten, about 16% of Latino children are obese, compared with only 10% of white children.[8] Furthermore, obesity disparities increase disproportionally for minority children with age and persist in adolescence[9-12] and adulthood.[13] Thus, although obesity is a significant health problem across all children, it is more concentrated among racial/ethnic minority children, who are more likely to experience socioeconomic disadvantages.[14]

1.1 Explaining the Obesity Epidemic among Latino children

Sociologists apply two main theoretical perspectives to explain health disparities and the incidence of obesity among Latino children: cultural and structural/economic. By combining these two theoretical approaches a holistic understanding of a major public health concern is achieved. Cultural arguments examine how group-specific cultural beliefs and family practices may impact weight problems. From this perspective, the sociocultural influences on childhood obesity, including parents' beliefs about well-being, body perceptions, and the meaning and function of food and eating, are key factors in understanding the obesity problem of Latino children.[15] Research, for example, shows that perceptions of body size and acknowledgment of weight problems are different across ethnic/racial groups, with minorities considering a larger body size as ideal and healthy than do whites.[15-17] For some racial/ethnic minority females, having heavy infants implies having healthy babies[17] and being heavy is considered a sign of strength, high self-esteem, and attractiveness.[18,19]

Furthermore, some food habits and customs are at the center of racial/ethnic minorities' value system and are major part of many Latino parents' cultural identity.[20, 21] In a study with Latina mothers, Sussner and her colleagues (2008) found that mothers revealed the cultural importance of "finishing their plates."[21] Also, cultural differences were associated with perceptions of healthiness of different types of food.[22] Cultural influences not only impact the way adults eat, but also how they socialize children around food behaviors and use food as a tool for parenting to reward behaviors.[17]

Immersed within discussions of cultural explanations of minority students' obesity are questions related to the role that acculturation – defined as the process of becoming a member of the U.S. culture and society through the adoption of practices and styles of the dominant group[23] – plays on childhood obesity.[22] This is particularly important for Latinos, about half (54%) of whom are foreign-born and a significant proportion are U.S.-born but live in immigrant families.[24] Research has shown inconsistent findings regarding the role acculturation

plays on Latinos' health outcomes. On the one hand, research shows that less acculturated Latino families have healthier eating habits[21, 25] and healthier prenatal practices.[26] And, as the length of residence in the United States increases, so do smoking and weight gains for Latino adolescents.[27] These findings support the "Immigrant Paradox," which argues that although immigrant families face financial challenges, foreign-born or first generation children often have better outcomes (e.g., health and education) than their native-born counterparts. Yet, additional research shows improvement of outcomes over time or in subsequent generations suggesting worst results for the first generation.[28, 29]

Sociological structural theories propose a different perspective on health disparities and childhood obesity. These theories (e.g. structural-functionalism approach[30], social Marxism[31]) argue that individual outcomes are being shaped by an underlying social and economic structure[32] and therefore the position of racial/ethnic minority groups within the U.S. social hierarchy and their sustained economic disadvantages are the main determinants of their health problems. Structural accounts of minorities' obesity focus on the impact of poverty and low income through which poverty perpetuates health disparities. On average, racial/ethnic minorities, especially African Americans and Latinos, have lower socioeconomic status (SES) and fewer material resources than whites. In 2010, poverty rates for Latinos and blacks were around 27%, compared to 9% for non-Latino whites. Family median incomes for Latinos and blacks were $37,000 and $32,000, respectively, which represents only around half the median income of whites.[33]

The importance of poverty in accounting for weight problems is vastly recognized in the literature since children and youth living in poverty are more likely to be obese and experience other health problems than those with more economic resources.[10, 34] The negative impact of childhood poverty on weight has long-lasting effects as one study (Wells, Evans, Beavis, and Ong 2010) implemented in upstate New York found that poverty negatively affected weight even when children reached the ages of 13 to 17.[35] Similar findings are reported by Poulton and his colleagues (2002), who found childhood SES negatively associated with obesity as well as with dental and mental health issues up to the age of 26 years old.[36]

Research consistently shows that, on average, children living in poverty have less access to recreational activities and time for exercising,[37] are less likely to exercise and be physically active, [4] and are more likely to watch TV.[17] Levels of poverty are also related to increased access to fast food restaurants,[38] food insecurity,[39] and lack of access to healthy foods.[40] Yet the role of SES in explaining young Latino children's obesity is contested. Balistri and Van Hook (2009), using the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), found a negative association between parents' education and BMI only for Latino children with foreign-born parents.[41] They found no association between these variables for Latino children with U.S.-born parents. Similar findings were obtained in a study with only Mexican-origin adolescents.[42] The inconsistent evidence on the relationship between SES indicators and obesity may be related to interaction effects between these variables and other variables like

gender,[43] or related to the fact that higher SES does not seem to protect Hispanic children against obesity.[44]

The purpose of this study was to examine the influence of home language and SES, as proxy of structural and acculturation indicators, on obesity disparities between non-Latino white and Latino young children. A commonly used indicator of acculturation in health and psychology research is language patterns.[45] Then, the joint influence of TV watching and physical activtiy on obesity is examined. It is also important to disentangle whether these micro-level mechanisms explain the effects of home language and SES on the same dependent variable. We know that TV watching and physically activity are separately associated with weight problems.[46-48] We also know that TV watching is associated with exposure to advertisements of high calorie foods, increased consumption of high-calorie foods and lower levels of physical activity.[8] Understanding the role of TV watching and physical activities on obesity disparities may be particularly important since Latino children are more likely to watch TV and are less likely to be physically active than white children.[49,50] At the same time, Latino parents report positive attitudes to TV watching and experience significant barriers to supporting their children in being physically active.[48,51] We analyzed the impact of these variables over time, when children were 5-years-old, on average, and then when they turned 6, 8 and 10 years old.

2. Methods

The data used in this study came from the Early Childhood Longitudinal Study (ECLS-K) Kindergarten Class of 1998-99, sponsored by the National Center of Education Statistics. The ECLS-K focused on young children's well-being outcomes and collected information through parent, teacher, and administrator interviews between the start of kindergarten through eighth grade. Using a multistage probability sampling design, the ECLS-K includes a nationally representative sample of about 21,000 kindergarteners in over 1,000 schools (for methodological details, see NCES, 2002).[52] In this article, the information analyzed came from Fall 1998 and Spring 1999 waves of data collection. To analyze long-term effects, follow-up obesity measures from Spring 2000, 2002, and 2004 were also included in the analysis. Analyses were conducted in 2012.

The study sample was restricted only to native non-Latino whites and Latino children (roughly 11,470 children). The sample was further restricted to only children deemed as obese or with normal weight based on CDC's tables of BMI-for-age growth charts percentile rankings (roughly 9,000 children). The sample for this study included 70% native non-Latino whites and 30% Latinos of any race. Almost half of the sample (48%) were females, 22% lived in single-parent families and the average number of siblings at home was 1.46. About 78% of the children lived in only English-speaking homes and 36% of their parents had a high school degree or lower education. The sample also included 14% obese and 86% normal-weight children.

The primary dichotomous outcome measure is obesity. To classify children as obese (y=1) or with normal weight (y=0) the body mass index (BMI) and the CDC's tables of BMI-for-age growth charts percentile rankings were used. Children were deemed as obese if their percentile rankings were equal to or greater than the 95th percentile. Children were considered as with normal weight if their percentile rankings were higher or equal to 5th percentile through 85th percentile.[53] BMI was calculated based on weight and height collected by ECLS-K staff using a Shorr board and a digital scale. Obesity was measured at four points in time: when children were on average 5-years-old (spring of kindergarten), and when children aged to 6 (spring of first grade), 8 (spring of third grade), and 10 (spring of fifth grade).

The main explanatory variables of the study were SES, home language, physical activity, and TV watching. To measure SES, a composite scale (mean=1 and a standard deviation=0) was used. The scale was included in the ECLS-K data and was created based on child's mother's and father's educational attainment and occupation, and family income.[52] To measure home language, parents' reported the language(s) that the mother and father spoke to the student (and vice versa). Children were defined as living in homes where language used was reported as 1) only English (reference category), 2) English and Spanish, or 4) only Spanish. TV watching was measured from parents' reported number of hours the child spent watching either TV or videos on school days. Physical activity was measured using an ordinal variable indicating amount of aerobic exercise that the child did on a regular basis. Parents reported whether their child exercised 1) less than other children, 2) about the same or 3) more than other children.

2.1 Statistical Methods

Logistic regression models with stepwise variable selection were estimated with adjusted standard errors given the complex sampling design and the nested structure of the ECLS-K using *svy* commands in Stata-12. Results were reported in odds-ratio. Four sequential regression models (Table 1) were estimated to analyze the relationship between obesity (Spring 1999) as the dependent variable and key explanatory variables for young children. *Model 1* included race/ethnicity (Latino=1 and white=0) as the independent variable. *Model 2* added SES and home language as independent variables. Model 3 added physical activity and TV watching and excluded home language and SES. *Model 4* includes all four independent variables. To analyze the long-lasting impact of these variables (Table 2), three models similar to Model 4 were estimated, but with obesity measured when children turned 6 (*Model 5*), 8 (*Model 6*), and 10 years old (*Model 7*) as the dependent variables. The following specific confounders were included as control variables in all models: weight at birth in pounds, gender, number of siblings at home, single-parent family, mother's age in years and depression.

3. Results

3.1 Association between SES, Home Language, and Obesity

As previous research has shown, young Latino children had higher incidence of obesity than white children (Model 1, Table 1). Latinos had two times the odds as whites to be obese, after controlling for covariates (weight at birth, gender, siblings at home, single-parent family, and mother's age and depression). The association between obesity and SES and home language was presented in Model 2, Table 1. After controlling for covariates, both variables were significantly associated with obesity. For a one-unit increase in SES, the expected change in log odds was 0.65. Similarly, compared to children living in only-English speaking homes, children living in homes with different language environments had higher incidences of obesity. Children living in only-Spanish speaking homes had 1.48 times the odds than those in only-English speaking homes to be obese.

When the influence of SES and home language was taken into account, the obesity gap between white and Latino children decreased considerably, although it remained borderline statistically significant (p-value=0.05).

3.2 The importance of TV watching and physical activity

We then examined the impact of hours of TV watching and amount of aerobic exercise (Models 3 and 4 in Table 1). Children whose parents reported they participated more in aerobic exercises than their peers and watched less TV were less likely to be obese. The significance of these findings were independent of including or not home language and SES in the model. After controlling for covariates and home language and SES, for a one-hour increase in TV watching, the expected change in log odds was 1.09. Also, the difference in log of the odds between a child who exercises more than other children in comparison to a child with lower levels of exercise is 0.67.

When we took into account the influence of TV watching and aerobic physical activity, together with home language and SES, the obesity gap between white and Latino young children became statistically non-significant (p-value=0. 08). The difference in obesity between the two racial/ethnic groups was explained by including all four variables in the model. These findings are specifically relevant to reduce the incidence of obesity among young Latino children because these children watch more TV and participate less in aerobic exercise than white children. On average, young Latino children in this sample watched two hours of TV a day whereas white children watched only 1.7 hours (t-test= 13.44, p-value <0.00). Also, a lower proportion of Latino children (18%) than of white children (21%) are participating more than other children in aerobic exercise (chi-squared=35.58, p-value<0.00). Nevertheless, is important to mentioned that physical activity and TV watching did not explain the SES or home language effects suggesting that other factors need to be explored.

3.3 Long-lasting effects of SES, Home Language, TV watching and physical activity

In order to develop interventions to reduce the young Latino obesity epidemic, it is important to identify mechanisms that have long-lasting effects and whose benefits are sustained over time. As Table 2 shows, the positive association between obesity and participation in aerobic exercises and the negative association between obesity and number of hours watching TV remained statistically significant even when children grew to ages 6, 8 and 10. Long-lasting effects of SES and home language were also observed over time. The associations observed across time maintain similar levels of significance and magnitude of associations.

3.4 Limitations

Future studies need to used improved acculturation measures. XX and colleagues argued that bidimentional (mutual influence of both cultures) and multidimensional better capture the complexity and dynamism of this construct. Home language, although a commonly used proxy, may not be able to capture this complexity. This limitation should be considered when interpreting the findings of this paper. Additional studies are also needed to examine the specific mechanisms that neutralize Latino young children's obesity disadvantages, as well as the effectiveness of interventions to reduce health problems. These future studies should include stronger measures of physical activity and exercise. The measures used in this study were based on parents' reports, which could be problematic given that it is a subjective measurement easily influenced by parents' perceptions. In the same way, we need research that takes into account the diversity of the Latino population in terms of country of origin[8] and gender[43] given that incidence of obesity varies function of subgroup memberships.

Additional limitations of this study include the fact that a secondary data was used and therefore important constructs (e.g., parents' obesity, time-varying exercise and TV watching patterns) that are also associated with the outcomes of interest. Also, this findings apply only to obese and normal children. Future studies should focus on examining patterns and influences for children who are at risk if becoming obese (overweight children).

4. Discussion and Conclusions

This study contributes new knowledge on Latino young children's health inequalities by analyzing the importance of SES, home language, physical activity, and TV watching for explaining obesity disparities between 5-year-old white and Latino children using nationally representative data, the ECLS-K. This paper also studied the lasting effect of these variables as children grow to age 6, 8, and 10. Given the high incidence of obesity among Latino children and its negative consequences on different dimensions of well-being, it is imperative to identify malleable mechanisms that could contribute to the reduction of health disparities among these children.

The present study provides empirical support for the importance of considering both structural/economic and cultural explanations when examining health disadvantages for minority groups. As Patterson (2000) argued, structural factors condition the context in which cultural attributes are manifested therefore both frameworks need to be examined interactively.[54]

Results showed that socioeconomic status and home language were relevant factors in explaining Latino children's obesity disparities after taking into account confounders. As other research has shown, children with greater access to economic resources were less likely to be obese than those that had fewer access to resources.[10] Also, children living in English-speaking homes were less likely to be obese than children living in homes with other language environments. Home language is considered as one indicator of acculturation, perhaps the most important one,[55] given that the language that children and their families use at home may reflect a tendency to maintain group-specific cultural values, norms, and practices. This research suggests that it may be possible that some practices and customs that Latino families have had in the past may not be conducive to healthy weight in the U.S. context. This is consistent with research conducted with Latino adolescents.[56] In both cases, acculturation does not seem to be as much of a risk factor as other research on health outcomes among immigrants have shown.[57] Future studies are needed to better understand the mechanisms through which and the context in which acculturation impacts obesity among Latino young children. Understanding the relationship between acculturation and obesity is particularly important for Latinos given their high proportion of foreign-born and those living in immigrant families.[24]

SES and home language are statistically significant predictors of obesity, yet these variables are not easily malleable and therefore are not particularly relevant to inform the development of interventions to reduce children's obesity. The results of this study show that increasing Latino children physical activity and reducing hours watching TV have important positive consequences for reducing Latino and white children disparities in obesity. TThe benefits of increasing physical activity and reducing TV watching have long-lasting effects even when children turn 6, 8, and 10 years old, which is particularly important given the need to implement interventions that will sustain their benefits over time.

Challenges remain to developing interventions to reduce TV watching and to increase physical activity for Latino young children. Latino children are more likely to live in poor neighborhoods and face lack of safety and higher violent crime than white children.[58] These are important barriers to outdoor physical activity for adults[59] and for adolescent girls.[60] Perception of neighborhood insecurity may be even more important for young children's physical activity. Also, TV may have additional roles for Latino families besides entertaining, as it was shown in a study with Latino mothers who emphasize the importance of TV as a tool to learn English for them and their children.[51]

This study provides a useful theoretical framework to understand young Latino obesity by integrating the explanatory power of both, cultural and structural/economic frameworks. Findings from this study also support the relevance of macro-contextual factors captured through SES and home language proxies. Furthermore, increasing physical activity and reducing TV watching, as moldable micro-level mechanisms, have important implications for reducing health inequalities and developing interventions for Latino young children, independently of the influence of acculturation and SES factors.

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Table 1
Logistic regression estimates of home language, SES, TV watching, and physical activity

	Model 1 Spring 1999		Model 2 Spring 1999		Model 3 Spring 1999		Model 4[a] Spring 1999	
	OR[b] (95% CI)	*p*-value	OR[b] (95% CI)	*p*-value	OR[b] (95% CI)	*p*-value	OR[b] (95% CI)	*p*-value
Latino[c]	2.03 (1.73, 2.38)	0.00	1.24 (1.00,1.57)	0.05	1.92 (1.63, 2.27)	0.00	1.23 (0.97,1.56)	0.08
Explanatory variables								
SES			0.65 (0.58,0.73)	0.00			0.65 (0.58,0.74)	0.00
HL[d]: English & Spanish			1.52 (1.18,1.97)	0.001			1.46 (1.12,1.90)	0.005
HL: only Spanish			1.48 (1.10,2.00)	0.008			1.41 (1.0341.92)	0.026
TV watching (hours)					1.12 (1.07, 1.18)	0.00	1.09 (1.04,1.14)	0.00
Aerobic exercise					0.66 (0.57, 0.76)	0.00	0.67 (0.57,0.78)	0.00
Control variables								
Birth weight	1.32 (1.24, 1.41)	0.00	1.33 (1.25,1.42)	0.00	1.33 (1.25, 1.43)	0.00	1.35 (1.26,1.44)	0.00
Female	0.97 (0.84, 1.14)	0.73	0.97 (0.84,1.13)	0.73	0.98 (0.84,1.15)	0.81	0.97 (0.84,1.14)	0.76
Mother's age	1.00 (0.98, 1.01)	0.63	1.01 (1.00,1.03)	0.07	1.00 (0.99,1.02)	0.89	1.01 (1.00,1.03)	0.05
Mother's depression	1.13 (0.95, 1.35)	0.17	1.06 (0.89,1.26)	0.53	1.10 (0.91,0.31)	0.35	1.03 (0.86,1.23)	0.75
Single-parent family	1.27 (0.79, 0.91	0.17	1.16 (0.96,1.40)	0.13	1.28 (1.05,1.56)	0.014	1.17 (0.96,1.42)	0.11
Number of siblings	0.85 (0.84, 1.14)	0.00	0.81 (0.76,0.87)	0.00	0.85 (0.79,0.91)	0.00	0.82 (0.76,0.88)	0.00

Note: Survey design to correct standard errors were used in all models. Unweighted sample size=8,550 children. Sample size was rounded to the nearest 10 because of restricted license requirements.

a Model 4: $P(yi=obese)= CDF(\beta 0 + \beta 1\ Latino_i + \beta 2\ SES_i + \beta 3\ \text{Home language } a_i + \beta 4\ \text{Home language } b_i + \beta 5\ \text{TV watching}_i + \beta 6\ \text{Aerobic exercise}_i + \beta 7\ \text{Birth weight}_i + \beta 8\ \text{female}_i + \beta 9\ \text{Mother's age}_i + \beta 10\ \text{Mother's depression}_i + \beta 11\ \text{Single-parent family}_i + \beta 11\ \text{Number of sibling}_i)$, where CDF is a Cumulative Density Function and "i" represents individual-level data.

b Coefficients reported are Odd ratio (OR), including confidence intervals (CI)

c Latino coefficient represent obesity disparities between White and Latino children

d Home language (HL)= Only English is the reference category

Table 2 - Logistic regression estimates of home language, SES, TV watching, and physical activity

	Model 5[a] Spring 2000		Model 6[a] Spring 2002		Model 7[a] Spring 2004	
	OR[b] (95% CI)	*p*-value	OR[b] (95% CI)	*p*-value	OR[b] (95% CI)	*p*-value
Latino[c]	1.20 (0.96,1.50)	0.12	1.11 (0.89,1.38)	0.34	1.13 (0.90,1.42)	0.30
Explanatory variables						
SES	0.68 (0.60,0.76)	0.00	0.65 (0.59,0.73)	0.00	0.58 (0.51,0.66)	0.00
HL[d]: English & Spanish	1.73 (1.33,2.25)	0.00	1.51 (1.17,1.94)	0.002	1.43 (0.10,1.86)	0.006
HL: only Spanish	1.28 (0.92,1.79)	0.15	1.40 (1.04,1.88)	0.025	1.23 (0.90,1.67)	0.20
TV watching (hours)	1.10 (1.05,1.16)	0.00	1.10 (1.04,1.15)	0.00	1.10 (1.03,1.16)	0.002
Aerobic exercise	.69 (0.60,0.81)	0.00	0.73 (0.64,0.83)	0.00	0.79 (0.68,0.91)	0.001
Control variables						
Birth weight	1.27 (1.20,1.35)	0.00	1.21 (1.15,1.27)	0.00	1.16 (1.10,1.23)	0.00
Female	0.97 (0.84,1.13)	0.71	0.94 (0.82,1.07)	0.35	0.72 (0.62,0.83)	0.00
Mother's age	1.02 (1.00,1.03)	0.02	1.01 (1.00,1.03)	0.02	1.01 (0.99,1.02)	0.28
Mother's depression	0.97 (0.81,1.15)	0.66	0.97 (0.81,1.15)	0.68	1.06 (0.87,1.29)	0.54
Single-parent family	1.30 (1.08, 1.57)	0.006	1.11 (0.92,1.33)	0.28	1.15 (0.94,1.39)	0.17
Number of siblings	0.88 (0.82, 0.95)	0.02	0.87 (0.82,0.94)	0.00	0.91 (0.85,0.97)	0.006
Sample size[e]	7510		6700		5340	

Note: Survey design to correct standard errors were used in all models. The unweighted sample sizes were rounded to the nearest 10 because of restricted license requirements.

a Model 4: $P(yi=obese)= CDF(\beta 0 + \beta 1\ Latino_i + \beta 2\ SES_i + \beta 3\ Home\ language\ a_i + \beta 4\ Home\ language\ b_i + \beta 5\ TV\ watching_i + \beta 6\ Aerobic\ exercise_i + \beta 7\ Birth\ weight_i + \beta 8\ female_i + \beta 9\ Mother's\ age_i + \beta 10\ Mother's\ depression_i + \beta 11\ Single\text{-}parent\ family_i + \beta 11\ Number\ of\ sibling_i)$, where CDF is a Cumulative Density Function and "i" represents individual-level data

b Coefficients reported are Odd ratio (OR), including confidence intervals (CI)

c Latino coefficient represent obesity disparities between White and Latino children

d Home language (HL)= Only English is the reference category

e Sample sizes decrease over time because of ECLS-k sampling design

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