Published in final edited form as:

Eat Behav. 2015 January ; 0: 43–46. doi:10.1016/j.eatbeh.2014.10.010.

Ethnic/racial disparities in adolescents' home food environments and linkages to dietary intake and weight status

Nicole Larson, PhD, MPH, RDN^a, Marla E. Eisenberg, ScD, MPH^b, Jerica M. Berge, PhD, MPH, LMFT^c, Chrisa Arcan, PhD, MHS, MBA, RD^d, and Dianne Neumark-Sztainer, PhD, MPH, RD^e

Marla E. Eisenberg: eisen012@umn.edu; Jerica M. Berge: jberge@umn.edu; Chrisa Arcan: arca0021@umn.edu; Dianne Neumark-Sztainer: neuma011@umn.edu

^bDivision of General Pediatrics and Adolescent Health, Department of Pediatrics, University of Minnesota. 717 Delaware St. SE, Minneapolis, MN 55414. USA

^cDepartment of Family Medicine and Community Health, University of Minnesota. 717 Delaware St. SE Room 424, Minneapolis, MN 55112. USA

^dDepartment of Family Medicine and Community Health, University of Minnesota. 717 Delaware St. SE Room 424, Minneapolis, MN 55112. USA

^eDivision of Epidemiology and Community Health, School of Public Health, University of Minnesota, 1300 South Second Street, Suite 300, Minneapolis, MN 55454. USA

Abstract

Research is needed to confirm that public health recommendations for home/family food environments are equally relevant for diverse populations. This study examined ethnic/racial differences in the home/family environments of adolescents and associations with dietary intake and weight status. The sample included 2,382 ethnically/racially diverse adolescents and their parents enrolled in coordinated studies, EAT 2010 (Eating and Activity in Teens) and Project F-EAT (Families and Eating and Activity in Teens), in the Minneapolis/St. Paul metropolitan area. Adolescents and parents completed surveys and adolescents completed anthropometric measurements in 2009–2010. Nearly all home/family environment variables ($n=7$ of 8 examined) were found to vary significantly across the ethnic/racial groups. Several of the home/family food environment variables were significantly associated with one or more adolescent outcome in expected directions. For example, parental modeling of healthy food choices was inversely

© 2014 Elsevier Ltd. All rights reserved.

^aCorresponding Author. Division of Epidemiology and Community Health, School of Public Health, University of Minnesota. 1300 South 2nd St., Minneapolis, MN 55454. USA. 612-625-5881. larsonn@umn.edu.

Contributors: N. Larson assisted with the acquisition of data, performed all data analysis, and drafted the manuscript. M.E. Eisenberg and J. Berge were involved in designing the overall study and planning the data analysis. C. Arcan assisted with the interpretation of results. D. Neumark-Sztainer conceived of the overall study and served as Principal Investigator for EAT 2010 and Project F-EAT. All authors critically reviewed and approved of the manuscript.

Conflict of Interest: N. Larson, M.E. Eisenberg, J. Berge, C. Arcan, and D. Neumark-Sztainer declare that they have no conflicts of interest relating to this research.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

associated with BMI z-score ($p=0.03$) and positively associated with fruit/vegetable consumption ($p<0.001$). Most observed associations were applicable across ethnic/racial groups; however, eight relationships were found to differ by ethnicity/race. For example, parental encouragement for healthy eating was associated with lower intake of sugar-sweetened beverages only among youth representing the White, African American, Asian, and mixed/other ethnic/racial groups and was unrelated to intake among East African, Hispanic, and Native American youth. Food and nutrition professionals along with other providers of health programs and services for adolescents should encourage ethnically/racially diverse parents to follow existing recommendations to promote healthy eating such as modeling nutrient-dense food choices, but also recognize the need for cultural sensitivity in providing such guidance.

Introduction

Adolescents from ethnic/racial minority backgrounds are at greatest risk for obesity and notable disparities exist in adherence to national dietary guidance for preventing chronic disease.¹⁻⁴ There is an urgent need to identify reasons for these disparities and expert groups have called for research to inform targeted prevention efforts by determining relevant influences on dietary behaviors within the environments where young people spend their time.⁵ Investigations that have considered the potential influence of environmental characteristics within multiple contexts on adolescent risk for obesity have emphasized the relevance of home and family factors.⁶⁻¹¹ However, few studies have collected comprehensive data on characteristics of home/family environments that may influence eating behaviors in ethnically/ racially diverse populations of youth with especially little research among certain U.S. immigrant subgroups (e.g., Hmong and Somali families). More information on the home/family food environments of ethnically/racially diverse populations is needed to design interventions for minority youth at high risk for obesity. In particular, there is a need to build on the limited existing research that has explored whether current public health recommendations for home/family food environments are equally relevant for diverse populations.

This study was designed to address two central research questions that are important in determining how best to meet the needs of ethnically/racially diverse families to reduce obesity and promote healthful eating. First, are there differences across ethnic/racial groups in the home/family environments of adolescents with regards to food availability and preparation, mealtime routines, and parental modeling and encouragement behaviors? Second, do observed associations between the home/family environment and measures of adolescents' weight status and dietary intake differ across ethnic/racial groups? Based on prior research and existing recommendations, it was hypothesized that greater availability of healthy foods and lower availability of unhealthy foods in the home and at family meals; meal planning and enjoyment of cooking; parental modeling of nutrient-dense food choices; and encouragement for healthy eating would be related to lower body mass index and more nutrient-dense dietary patterns across multiple ethnic/racial groups.¹²⁻¹⁸

Methods

Study Design and Population

Data for this analysis were drawn from two coordinated, population-based studies. EAT 2010 (Eating and Activity in Teens) was designed to examine dietary intake, physical activity, weight status and factors associated with these outcomes in adolescents from 20 public middle schools and high schools in the Minneapolis/St. Paul metropolitan area of Minnesota. Project FEAT (Families and Eating and Activity in Teens) was designed to examine factors within the home and family environments of potential relevance to adolescents' weight-related behaviors. All study procedures were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee and by the research boards of participating school districts.

The analytic sample included 2,374 adolescents (53.8% girls) who completed the EAT 2010 survey, provided information on ethnicity/race, and had at least one parent or other caregiver (described here as parents) respond to the Project F-EAT survey. The mean age of adolescent participants was 14.4 years (SD=2.0) and 69.9% of the sample qualified for free or reduced-price school meals. Seven ethnic/racial groups were represented, including White (20.2%), African American or Black (23.2%), East African (5.6%), Asian (20.0%), Hispanic (17.1%), Native American (3.2%), and mixed/other (10.7%). Most of the Asian American population was from Southeast Asia; 83.4% of this group was Hmong. Among parents, 62.0% were female and their mean age was 42.3 years (SD=8.4).

Adolescent Assessments

For EAT 2010, classroom-administered student surveys, food frequency questionnaires (FFQ),^{19, 20} and anthropometric measures were completed by adolescents during the 2009-2010 academic year. Trained research staff measured adolescents' height and weight using standardized procedures²¹ and administered other assessments during selected health, physical education, and science classes. The wording of survey items, response options, and psychometric properties for measures used in the current analysis are described in Supplemental Table 1. The student survey was used to assess demographic characteristics, home food availability, family meal frequency, parental food modeling, and parental encouragement of healthy eating. Past year dietary intake of fruit, vegetables, and sugar-sweetened beverages was assessed on the FFQ. Among adolescents who were at school on the days of survey administration, 96.3% had parental consent and chose to participate.

Parent/Caregiver Survey

Data for Project F-EAT were collected by surveying up to two parents of adolescent participants in EAT 2010 using contact information provided by the adolescent.^{22, 23} Parents were given the options of responding to a written survey by mail or completing a telephone interview. Measures included on the written survey and telephone interview were drawn from previously published tools²⁴⁻²⁶ when possible and pilot tested to ensure cultural sensitivity as described previously.²⁷ The final written F-EAT survey was professionally translated into Spanish, Somali, and Hmong, and these versions were sent to parents when the adolescent indicated that the primary language spoken at home was not English.

Telephone interviews were additionally administered in Karen, Oromo, and Amharic as needed. Survey items are described in Supplemental Table 1, including measures of parental education, meal planning and preparation, priority for family meals, and the serving of healthy foods at meals. The overall response rate for the Project F-EAT survey was 77.6%.

Statistical Analysis

Analysis of variance was used to examine differences in home/family environment variables across ethnic/racial groups. Differences were examined both with and without adjustment for parental education as education and ethnicity/race were strongly associated in bivariate analyses ($\chi^2=680.3$, $p<0.001$). Post-hoc tests were used to compare ethnic/racial groups. Multiple linear regression analysis modeled each continuous adolescent outcome variable (i.e., intake of fruit and vegetables and sugar-sweetened beverages, BMI z-scores) based on each home/family environment variable, separately, adjusted for ethnicity/race, gender, age, and parental education.

In order to determine if the observed associations between home/family environment variables and each adolescent outcome variable were consistent across the ethnic/racial groups, interaction terms were added to each regression model (ethnicity/race by environment variable). For each case where the p -value for an interaction term was <0.10 and provided some evidence of effect modification, models were re-run stratified by ethnicity/race and adjusting for covariates. The liberal cut-off of $p<0.10$ was selected to permit a thorough exploration of trends across ethnic/racial groups, including those with smaller numbers.

Results

Characteristics of Home/Family Environments across Ethnic/Racial Groups

All home/family environment variables with the exception of family meal frequency were found to vary significantly across the ethnic/racial groups (Table 1). Despite these differences, no consistent patterns emerged among the ethnic/racial groups in terms of their home/family environments being more or less supportive of healthy eating. For example, Asian adolescents reported lower home healthy food availability but also had among the lowest average scores for home unhealthy food availability and the highest average score for parental modeling of fruit and vegetable consumption. The pattern of results described here and detailed in Table 1 was very similar to the results from models adjusted for parental education, suggesting the observed differences according to ethnicity/race were not due largely to ethnic/racial disparities in educational attainment.

Home/Family Environment and Adolescent Dietary Intake and Weight Status

Several characteristics of home/family environments were significantly associated in expected directions with one or more adolescent outcome in models adjusting for ethnicity/race, gender, age, and parental education (data not shown). Scores for healthy food availability, meal planning and preparation, family meal frequency, healthy foods served at meals, parental modeling of fruit and vegetable consumption, and parental healthy eating encouragement were positively related to adolescent fruit and vegetable consumption (all

$p<0.001$). A greater availability of unhealthy food and lower scores for healthy foods served at meals and parental healthy eating encouragement were related to higher adolescent sugar-sweetened beverage consumption (all $p<0.001$). Adolescent BMI z-score was inversely associated with unhealthy food availability ($p<0.001$), family meal frequency ($p<0.001$), and parental healthy food modeling ($p=0.03$). Although statistically significant, most observed associations were small in magnitude. For example, each additional family meal in the past week was related to adolescent consumption of approximately 0.1 additional serving of fruit and vegetables.

To determine whether observed associations between characteristics of home/family environments and adolescent outcomes differed across ethnic/racial groups, interaction terms were added to the models just described. The results indicated most observed associations were applicable across ethnic/racial groups; however, there was evidence of effect modification beyond what would be expected due to chance. Of the 24 interaction tests, seven tests were statistically significant and one test was near significant ($p<0.10$). The eight associations for which evidence of effect modification was present were further explored in models stratified by ethnicity/race and adjusted for gender, age, and parental education to allow for a more detailed description of differences across groups.

Detailed results from the eight stratified models are presented in Table 2. Associations between adolescent fruit and vegetable intake and unhealthy food availability, meal planning and preparation, healthy foods served at meals, parental modeling of fruit and vegetable consumption, and parental healthy eating encouragement all varied by ethnicity/race. Similarly, associations between adolescent sugar-sweetened beverage intake and healthy food availability, healthy foods served at meals, and parental healthy eating encouragement were also found to vary by ethnicity/race. No evidence of effect modification was found for associations with adolescent BMI z-score and thus stratified models are not shown for this outcome.

Discussion

This study described ethnic/racial differences in characteristics of adolescents' home/family food environments and examined linkages to dietary intake and weight status. The results showed differences across ethnic/racial groups for nearly all home/family environment characteristics examined here, but no consistent pattern emerged to suggest any groups had home/family environments that were overall more or less supportive of healthy eating. In general, characteristics of a supportive home/family environment were linked to indicators of better dietary intake and lower BMI z-scores in adolescents despite variation in the relevance of specific characteristics across outcomes. Observed effect sizes were small; however, these relationships may play an important role at the population level.

Study strengths included the large size and diversity of the sample, extensive assessment of home/family food environments with direct collection of some information from parents, and collection of measured heights and weights. Although the sample was large and diverse, some differences in the statistical significance of associations across ethnic/racial groups might have been due to relatively small subgroup sample sizes. Specifically, there were only

76 Native American adolescents and 132 East African adolescents in the sample in contrast to the larger numbers of White (n=480) and African American (n=550) adolescents. Further, it was not possible to consider the role of acculturation in the analytic models presented here as immigrant status was almost fully confounded with ethnicity/race (e.g., Hispanic, Asian, and East African groups were most often born outside of the U.S.). While analytic models in the current study were adjusted for parental education, a well-established measure of household socioeconomic position, it is also possible the models did not fully account for socioeconomic differences across ethnic/racial groups.^{28, 29} A validated FFQ was used to comprehensively assess dietary intake;^{19, 20} however, this FFQ may not fully capture the intake patterns of recent immigrant groups (e.g., East African, Hmong) that were unrepresented in the validation sample. Finally, the cross-sectional design limits our understanding of temporality.

In conclusion, findings from the current study indicate that recommendations for providing a home environment that promotes healthy eating and reduces risk for obesity are mostly pertinent for families of adolescents without regard to ethnic or racial background. However, the focus of interventions for diverse families should be tailored to reduce observed disparities in home food environments (e.g., ensuring access and adequate monetary resources to purchase culturally acceptable healthy foods for the home). Food and nutrition professionals along with other providers of health programs and services for adolescents should encourage diverse parents to follow existing recommendations, but also recognize the need for cultural sensitivity in providing such guidance. Attitudes and practices around food and eating should be explored before providing recommendations to families and culturally-tailored advice offered when appropriate. Researchers should further conduct qualitative studies addressing the interplay of acculturation and ethnicity/race on the home/family food environment and quantitative studies in samples with greater diversity in immigrant status to inform interventions that are sensitive to cultural differences.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Role of Funding Sources: This project was supported by the National Heart, Lung, and Blood Institute under grants R01HL084064 and R01HL093247 and by the Children's Discovery Fund of the University of Minnesota's Department of Pediatrics. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the University of Minnesota. The funding bodies had no role in study design; collection, analysis or interpretation of data; report writing or decisions to submit manuscripts.

References

1. Eaton D, Kann L, Kinchen S, Shanklin S, Flint K, Hawkins J, Harris W, Lowry R, McManus T, Chyen D, Whittle L, Lim C, Wechsler H. Centers for Disease Control and Prevention (CDC). Youth risk behavior surveillance - United States, 2011. *MMWR Surveill Summ.* 2012; 61(4):1-162. [PubMed: 22673000]
2. Ogden C, Carroll M, Kit B, Flegal K. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA.* 2014; 311(8):806-14. [PubMed: 24570244]

3. Kirkpatrick S, Dodd K, Reedy J, Krebs-Smith S. Income and race/ethnicity are associated with adherence to food-based dietary guidance among US adults and children. *J Acad Nutr Diet*. 2012; 112(5):624–35. [PubMed: 22709767]
4. Wang Y, Orleans C, Gortmaker S. Reaching the Healthy People goals for reducing childhood obesity: closing the energy gap. *Am J Prev Med*. 2012; 42(5):437–44. [PubMed: 22516482]
5. National Institutes of Health Obesity Research Task Force. Strategic plan for NIH obesity research. National Institutes of Health, U.S. Department of Health and Human Services; 2011. NIH Publication No. 11-5493
6. Crawford D, Ball K, Cleland V, Campbell K, Timperio A, Abbott G, Brug J, Baur L, Salmon J. Home and neighbourhood correlates of BMI among children living in socioeconomically disadvantaged neighbourhoods. *Br J Nutr*. 2012; 107(7):1028–36. [PubMed: 21824445]
7. Miller D. Associations between the home and school environments and child body mass index. *Soc Sci Med*. 2011; 72:677–84. [PubMed: 21227558]
8. Elder J, Arredondo E, Campbell N, Baquero B, Duerksen S, Ayala G, Crespo N, Slymen D, McKenzie T. Individual, family, and community environmental correlates of obesity in Latino elementary school children. *J Sch Health*. 2010; 80(1):20–30. [PubMed: 20051087]
9. Crawford D, Cleland V, Timperio A, Salmon J, Andrianopoulos N, Roberts R, Giles-Corti B, Baur L, Ball K. The longitudinal influence of home and neighborhood environments on children's body mass index and physical activity over 5 years: the CLAN study. *Int J Obes*. 2010; 34(7):1177–87.
10. Brogan K, Carcone A, Jen KL, Ellis D, Marshall S, Naar-King S. Factors associated with weight resilience in obesogenic environments in female African-American adolescents. *J Acad Nutr Diet*. 2012; 112:718–24. [PubMed: 22709777]
11. Larson N, Wall M, Story M, Neumark-Sztainer D. Home/family, peer, school, and neighborhood correlates of obesity in adolescents. *Obesity*. 2013; 21(9):1858–69. [PubMed: 23512596]
12. Elfhag K, Tholin S, Rasmussen F. Consumption of fruit, vegetables, sweets and soft drinks are associated with psychological dimensions of eating behaviour in parents and their 12-year-old children. *Public Health Nutr*. 2008; 11(9):914–23. [PubMed: 18498675]
13. van der Horst K, Oenema A, Ferreira I, Wendel-Vos W, Giskes K, van Lenthe F, Brug J. A systematic review of environmental correlates of obesity-related dietary behaviors in youth. *Health Educ Res*. 2007; 22:203–26. [PubMed: 16861362]
14. Bere E, Glomnes ES, te Velde SJ, Klepp KI. Determinants of adolescents' soft drink consumption. *Public Health Nutr*. 2008; 11(1):49–56. [PubMed: 17582242]
15. Pearson N, Biddle S, Gorely T. Family correlates of fruit and vegetable consumption in children and adolescents: a systematic review. *Public Health Nutr*. 2009; 12(2):267–83. [PubMed: 18559129]
16. Larson NI, Story M, Eisenberg ME, Neumark-Sztainer D. Food preparation and purchasing roles among adolescents: associations with sociodemographic characteristics and diet quality. *J Am Diet Assoc*. 2006; 106(2):211–8. [PubMed: 16442868]
17. Neumark-Sztainer D, Larson N, Fulkerson J, Eisenberg M, Story M. Family meals and adolescents: What have we learned from Project EAT (Eating Among Teens)? *Public Health Nutr*. 2010; 13(7):1113–21. [PubMed: 20144257]
18. Barlow S. the Expert Committee. Expert Committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics*. 2007; 120:S164–92. [PubMed: 18055651]
19. Rockett H, Wolf A, Colditz G. Development and reproducibility of a food frequency questionnaire to assess diets of older children and adolescents. *J Am Diet Assoc*. 1995; 95(3):336–40. [PubMed: 7860946]
20. Rockett H, Breitenbach M, Frazier A, Witschi J, Wolf A, Field A, Colditz G. Validation of a youth/adolescent food frequency questionnaire. *Prev Med*. 1997; 26(6):808–16. [PubMed: 9388792]
21. Gibson, R. Principles of Nutritional Assessment. New York, NY: Oxford University Press; 1990.
22. Bruening M, MacLehose R, Loth K, Story M, Neumark-Sztainer D. Feeding a family in a recession: food insecurity among Minnesota parents. *Am J Public Health*. 2012; 102(3):520–6. [PubMed: 22390517]

23. Neumark-Sztainer D, Loth K, Fulkerson J, MacLehose R, Eisenberg M, Berge J. What's for dinner? Types of food served at family dinner differ across parent and family characteristics. *Public Health Nutr.* 2014; 17(1):145–55. [PubMed: 23083836]
24. Crawford D, Ball K, Mishra G, Salmon J, Timperio A. Which food-related behaviors are associated with healthier intakes of fruits and vegetables among women. *Public Health Nutr.* 2007; 10(3):256–65. [PubMed: 17288623]
25. Fulkerson J, Lytle L, Story M, Moe S, Samuelson A, Weymiller A. Development and validation of a screening instrument to assess the types and quality of foods served at home meals. *Int J Behav Nutr Phys Act.* 2012; 9:10. [PubMed: 22313614]
26. Boutelle K, Fulkerson J, Neumark-Sztainer D, Story M, French S. Fast food for family meals: relationships with parent and adolescent food intake, home food environment and weight status. *Public Health Nutrition.* 2007; 10(1):16–23. [PubMed: 17212838]
27. Loth K, MacLehose R, Fulkerson J, Crow S, Neumark-Sztainer D. Eat this, not that! Parental demographic correlates of food-related parenting practices. *Appetite.* 2013; 60(1):140–7. [PubMed: 23022556]
28. Zarnowiecki D, Dollman J, Parletta N. Associations between predictors of children's dietary intake and socioeconomic position: a systematic review of the literature. *Obes Rev.* 2014; 15(5):375–91. [PubMed: 24433310]
29. Shavers VL. Measurement of socioeconomic status in health disparities research. *J Natl Med Assoc.* 2007; 99(9):1013–23. [PubMed: 17913111]

Highlights

- Ethnic/racial differences in adolescents' home/family food environments are described.
- Most home/family characteristics examined significantly varied by ethnicity/race.
- Supportive environment characteristics were linked to better diets and lower BMI.
- Relevance of some environment characteristics for outcomes varied by ethnicity/race.
- Interventions for diverse families should be tailored to reduce disparities.

Table 1
Home/family food environment characteristics across 7 ethnic/racial groups

N (of adolescents)	R ²	F, <i>p</i>	White	African American	East African	Asian	Hispanic	Native American	Mixed/ other
			481	550	132	475	405	76	255
Home food availability and preparation									
Healthy food availability (range: 4-16)	0.04	15.3, <0.001	12.8 ^a	12.6 ^a	12.5 ^a	11.5 ^b	12.6 ^a	12.6 ^a	12.7 ^a
Unhealthy food availability (range: 4-16)	0.06	26.1, <0.001	10.6 ^a	10.6 ^a	9.0 ^b	9.0 ^b	9.8 ^c	10.6 ^a	10.6 ^a
Meal planning/preparation (range: 4-16)	0.03	11.8, <0.001	11.5 ^a	11.5 ^{a,b}	10.6 ^c	10.9 ^c	11.8 ^b	11.6 ^{a,b}	11.4 ^a
Mealtime routines									
Family meal frequency (range: 0-10)	0.00	2.0, 0.05	4.8 ^a	4.4 ^{b,c}	4.3 ^{a,b}	4.5 ^{a,b}	4.7 ^{a,c}	4.5 ^{a,b}	4.0 ^b
Priority for family meals (range: 4-16)	0.01	3.4, 0.003	8.9 ^b	8.7 ^b	8.6 ^{a,b}	8.9 ^b	8.3 ^a	8.7 ^{a,b}	8.6 ^{a,b}
Healthy foods served at meals (range: 5-20)	0.05	21.1, <0.001	14.0 ^a	12.5 ^b	14.2 ^a	13.3 ^c	12.7 ^b	12.8 ^{b,c}	12.6 ^b
Parental behaviors									
Parental healthy food modeling (range: 6-24)	0.04	16.7, <0.001	18.2 ^a	16.3 ^b	18.1 ^a	16.3 ^b	17.1 ^c	16.3 ^{b,c}	16.9 ^{b,c}
Parental fruit/vegetable modeling (range: 4-16)	0.01	6.1, <0.001	12.7 ^{a,d}	12.1 ^b	12.3 ^{a,b}	12.9 ^d	12.6 ^{a,c,d}	11.6 ^b	12.3 ^{b,c}
Parental milk modeling (range: 2-8)	0.14	65.6, <0.001	5.5 ^a	4.2 ^c	5.8 ^a	3.4 ^d	4.5 ^b	4.7 ^b	4.6 ^b
Parent healthy eating encouragement (range: 2-8)	0.02	7.1, <0.001	6.0 ^a	5.4 ^b	6.1 ^a	6.0 ^a	6.0 ^a	5.4 ^b	5.9 ^a

a,b,c,d,e : in each row, cells that share a superscript do not differ ($p > .05$)

Table 2
**Associations of home food environment characteristics with adolescent fruit/vegetable and sugar-sweetened beverage intake by ethnicity/
race^{a,b}**

	Fruit and vegetable intake				Sugar-sweetened beverage intake			
	Unhealthy food availability (β, p)	Meal planning/preparation (β, p)	Healthy foods served at meals (β, p)	Parental fruit/vegetable modeling (β, p)	Parental healthy eating encouragement (β, p)	Healthy food availability (β, p)	Healthy foods served at meals (β, p)	Parental healthy eating encouragement (β, p)
White	-.024, .009	.048, <.001	.05, <.001	.05, <.001	.058, <.001	-.023, .012	-.05, <.001	-.039, .002
African American	-.008, .45	.012, .42	.009, .43	.05, <.001	.029, .05	.001, .93	-.02, .01	-.023, .042
East African	.039, .14	-.03, .39	.08, <.001	.06, .006	.087, .02	.004, .80	.02, .18	-.018, .45
Asian	.022, .08	.035, .03	.02, .10	.06, <.001	.067, <.001	.008, .35	-.02, .047	-.034, .005
Hispanic	.004, .73	-.002, .91	.05, <.001	.05, <.001	.072, <.001	.005, .61	-.04, <.001	.001, .92
Native American	-.040, .15	.094, .013	.04, .21	.001, .97	-.055, .20	-.002, .94	-.003, 0.90	.035, .36
Mixed/other	-.016, .33	.022, .29	.04, .03	.02, .20	.043, .08	.026, .047	-.01, .37	-.04, .01

^a Boldface type indicates statistical significance (p<.05) in models adjusted for adolescent gender and age, and parental education

^b A daily serving was defined as the equivalent of one-half cup for fruit and vegetables and the equivalent of one glass, bottle, or can for sugar-sweetened beverages.