

Race-Specific Predictors of Physical Activity and Healthy Eating Indicators among Urban Black and White Middle School Students in Cambridge, Massachusetts

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Background

Between 2004 and 2007, concurrent with school-based initiatives in Cambridge, MA, obesity declined (20.2% to 18.0%) and physical fitness improved among elementary and middle school students (K-8th grade). However, racial disparities in obesity persisted despite universal gains (24.1% Black/African American vs. 11.3% White students, 2007).

In 2009 the Healthy Eating and Living Project (HELP) was formed to explore and understand this disparity. Using a community based participatory approach, mixed quantitative and qualitative data were used to inform the development of obesity interventions targeting Black/African American youth in Cambridge, MA.

Quantitative data included the 2007 Cambridge Middle School Youth Risk Behavior Survey (YRBS). This data was used to examine racial differences in healthy eating and physical activity behavioral indicators and to identify social and behavioral factors associated with them. Results were used to inform the HELP research. The aim of the current study is to disseminate the results of this quantitative analysis as well as to describe the utilization of findings.

Study Setting: Cambridge, MA

Total population: 106,238

Nativity: 26.8% of Cambridge residents are foreign born

Density: 15,766 persons/square mile of land area

Public School enrollment: 5,599 children (pre-K through 12th grade)

Student racial/ethnic composition:

35.7% White, non-Hispanic

36.0% Black/African-American

14.7% Hispanic

11.0% Asian

2.5% other, including multi-racial

Socio-economic status: 42.7% of students low-income

Language: 30% of children are First Language not English (FLNE)

Source: US Census Bureau, Census 2000 & American Community Survey 2006-2008; MA Department of Elementary and Secondary Education (2006-2007 school year)

Data Collection

Cambridge Public Schools conduct the Middle School YRBS on alternating years via an anonymous self-administered survey. All students in grades 6-8 are invited to participate. Data for the current study included all respondents of the 2007 survey who self-identified as Black/African American (n=287) or White (n=274). Overall response rate was ≈ 89%.

Primary outcomes of interest were behavioral indicators of healthy eating and physical activity: 1) consumption of sugar sweetened fruit drinks, 2) consumption of fruits and vegetables, 3) vigorous physical activity, and 4) television viewing. The social and behavioral factors explored included socio-demographics, stress and violence, academic/community/home involvement, and health-related behaviors.

Organizations involved in the project

- Institute for Community Health, Cambridge Health Alliance
- School Health Program, Cambridge Public Health Department
- Cambridge Public Schools
- Margaret Fuller Neighborhood House Inc
- Men of Color Program, Cambridge Public Health Department
- Division of General Medicine, Brigham and Women's Hospital
- Department of Society, Human Development and Health, Harvard School of Public Health



Statistical Analysis

Prevalence of healthy eating and physical activity outcomes were compared by race using cross tabulations with Chi-square tests. Associations between social and behavioral factors and the primary outcomes were examined using logistic regression models stratified by race and adjusting for age and gender. Outcomes were coded in the negative to explore factors associated with the less desirable behavior. Only variables missing fewer than 5% of responses for either group were included in analyses.

Study Sample

Table 1: Description of Study Population, by Race

	Black/African American (N=287)	White, non-Hispanic (N=274)
Sex: Male	46.7%	51.8%
Grade Level: 6 th Grade	38.3%	37.2%
7 th Grade	33.0%	33.9%
8 th Grade	28.8%	28.8%
Is Foreign Born	23.8% ****	10.7%
Languages Spoken at Home (all that apply):		
English	75.5% ****	94.4%
Spanish	4.6%	6.0%
Haitian Creole	25.2% ***	1.1%
Portuguese	1.8% **	6.3%
Amharic/Tigrinya	9.9% ****	0.0%
Other	17.4%	18.3%
English Spoken most often at Home	73.8% ****	92.2%
Resides in Public/Transitional Housing	19.5% ****	6.3%

P<0.01, **P<0.0001; Chi-square test

Results

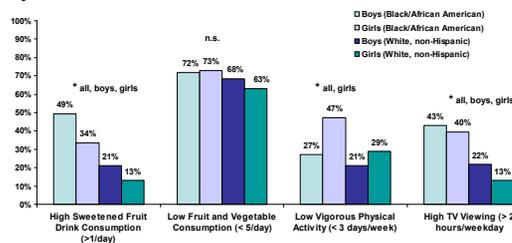
Overall, the majority of outcomes explored were more frequently self-reported by Black/African American students compared to their White, non-Hispanic counterparts:

- High sweetened fruit drink consumption (41% vs. 17%, P<0.0001)
- Low vigorous physical activity (38% vs. 25%, P<0.01)
- High TV viewing (41% vs. 18%, P<0.0001)

By gender (as illustrated in Figure 1) some clear differences were observed for two of the outcomes:

- Sweetened fruit drink consumption** - while both Black/African American boys and girls reported higher consumption, boys were particularly high consumers (49% reported more than 1 per day).
- Low vigorous physical activity** - the overall difference observed by race was driven by the self-reported behavior of Black/African American girls who were particularly likely to report low vigorous physical activity (47% reported less than 3 days per week). Black/African American boys reported activity that was similar to White, non-Hispanic boys.

Figure 1: Differences in Healthy Eating and Physical Activity Indicators by Race and Sex



*P<0.05 Chi-square test; significant difference between black and white students among all, boys, and/or girls

Results, continued

The social and behavioral factors explored included YRBS questions related to socio-demographics, stress and violence, academic/community/home involvement, and health-related behaviors. As illustrated in Table 2, we observed both differing and similar patterns of association between these factors and the outcome indicators by race.

- Sweetened fruit drink consumption** - Patterns were generally very different between the race groups for all categories, particularly among the stress and violence items.
- Fruit and vegetable consumption** - Similar patterns by race were observed for school/community/home involvement and health related behaviors, with differences observed among the socio-demographic and stress and violence items.
- Vigorous physical activity** - The school/community/home involvement items were similarly associated in both race groups, with differences observed among the socio-demographic and stress and violence items.
- High TV viewing** - Differing patterns by race were observed for socio-demographic, stress and violence, and academic/community/home involvement. Associations with health related behaviors were similar in both groups.

The magnitude of effect (odds ratios) for a subset of these associations, stratified by race, are detailed in Figures 3A-3D.

Table 2: Social/Behavioral Factors Associated with Outcome Indicators, by Race

Factor	High Sweetened Fruit Drink Consumption (>1/day)		Low Fruit and Vegetable Consumption (<5/day)		Low Vigorous Physical Activity (<3 days/week)		High Television Viewing (>2 hours/week/day)	
	Black	White	Black	White	Black	White	Black	White
Male	↓	↓	↓	↓	↓	↓	↓	↓
Younger age	↓	↓	↓	↓	↓	↓	↓	↓
Foreign born	↓	↓	↓	↓	↓	↓	↓	↓
Lives in public/transitional housing	↓	↓	↓	↓	↓	↓	↓	↓
Worried about in prior 12 months:								
Family not having enough money to get by	↓	↓	↓	↓	↓	↓	↓	↓
Physical health	↓	↓	↓	↓	↓	↓	↓	↓
Weight	↓	↓	↓	↓	↓	↓	↓	↓
Physical fights at home	↓	↓	↓	↓	↓	↓	↓	↓
Drug or alcohol use in family	↓	↓	↓	↓	↓	↓	↓	↓
Being treated unfairly because of race	↓	↓	↓	↓	↓	↓	↓	↓
Violence in the neighborhood	↓	↓	↓	↓	↓	↓	↓	↓
Was bullied/rejected at school prior 12 months	↓	↓	↓	↓	↓	↓	↓	↓
Usual grades are A's and B's	↓	↓	↓	↓	↓	↓	↓	↓
During this school year, participated in:								
Academic groups, clubs, or student government	↓	↓	↓	↓	↓	↓	↓	↓
Community service, in or out of school	↓	↓	↓	↓	↓	↓	↓	↓
After-school sports	↓	↓	↓	↓	↓	↓	↓	↓
Community-organized youth sports	↓	↓	↓	↓	↓	↓	↓	↓
During the past 7 days, participated in:								
Family responsibilities or chores	↓	↓	↓	↓	↓	↓	↓	↓
After-school programs, youth/teen centers, etc.	↓	↓	↓	↓	↓	↓	↓	↓
Reading, not required for school	↓	↓	↓	↓	↓	↓	↓	↓
Hobbies/pastimes/interests on own	↓	↓	↓	↓	↓	↓	↓	↓
High sw sweetened fruit drink consumption (> 1/day)	xxxxxxx	xxxxxxx						
Low fruit/veg consumption (<5/day)	xxxxxxx	xxxxxxx						
Low vigorous physical activity (<3 days/week)	xxxxxxx	xxxxxxx						
High television viewing (>2 hours/week/day)	xxxxxxx	xxxxxxx						
Currently trying to lose weight	↓	↓	↓	↓	↓	↓	↓	↓
Perceived self to be overweight	↓	↓	↓	↓	↓	↓	↓	↓
Fewer Family Dinners (<5 per week)	↓	↓	↓	↓	↓	↓	↓	↓
Has television in bedroom	↓	↓	↓	↓	↓	↓	↓	↓

Utilization of Findings

Findings were utilized over the course of the HELP project:

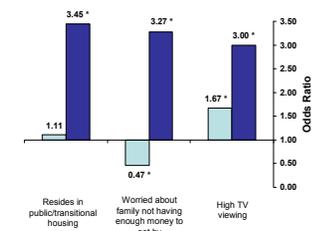
- To inform development of quantitative data collection instruments including a self-administered survey of Black/African American parents of students in Cambridge Public Schools.
- To inform development of qualitative data collection methodology including an interview guide for parent-child dyad interviews.
- To engage the Cambridge Black/African American community in discussions and to solicit input and consensus on an intervention strategy via a series of "workshops".

ACKNOWLEDGEMENTS:
We would like to thank the administration of the Cambridge Public Schools, the Cambridge School Committee and Cambridge City for their vision in taking on obesity among children. Thanks also to the Cambridge Public Health Department and School Health Program and the Institute for Community Health for contributions over and above the grant dollars. Lastly, we would like to thank the Harvard Catalyst Pilot Grant program for funding this project.

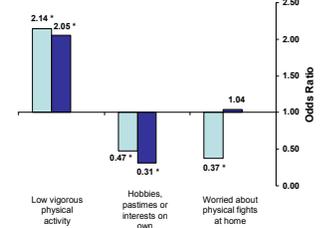
Figures 3A-3D: Selected Associations, by Race (odds-ratios)

Black/African American
White, non-Hispanic

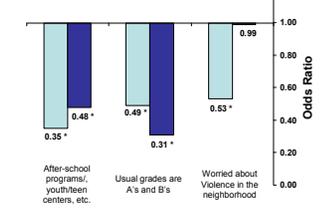
A: High Sweetened Fruit Drink Consumption



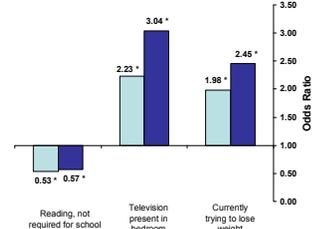
B: Low Fruit and Vegetable Consumption



C: Low Vigorous Physical Activity



D: High Television Viewing



*P<0.05, determined from logistic regression controlling for age and gender