YES Occasional Papers

Paper 6

Obesity and Lifestyle Habits Among American Adolescents: A Study of SES, Gender, and Racial/Ethnic Differences 1986–2003

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A Study Supported by the Robert Wood Johnson Foundation

YOUTH, EDUCATION, AND SOCIETY

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INTRODUCTION

The purpose of this study is to contribute to our understanding of the obesity epidemic currently affecting American youth. Research suggests that the burden of many diseases falls more heavily on racial/ethnic minority populations and on those of lower socioeconomic status (Campaigne et al., 1994; U.S. Department of Health and Human Services, 2001). In this study, we specifically examine the extent to which the prevalence rates of (a) being overweight and (b) engaging in potentially important health-related behaviors vary according to youth racial/ethnic minority background and socioeconomic status (SES). We examine the extent to which body mass index (BMI), overweight, and lifestyle habits suspected to be associated with overweight vary according to gender, racial/ethnic backgrounds, socioeconomic status (SES), population density, and region. These associations are examined among national representative samples of American youth over a 10-year period for 8th and 10th graders and over a 17-year period for 12th graders.

Obesity in the United States

The prevalence of obesity among youth and adults in the United States has reached epidemic proportions (Johnston & O'Malley, 2003: Kimm & Obarzanek, 2002; Ogden, Flegal, Carroll, & Johnson, 2002; Popkin & Udry, 1998), and health care costs associated with overweight and obesity have risen considerably in recent years (Finkelstein, Fiebelkorn, & Wang, 2003; Finkelstein, Fiebelkorn, & Wang, 2004; U.S. Department of Health and Human Services, 2001). The recent Surgeon General's report "The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity" and the Institute of Medicine's report "Preventing Childhood Obesity: Health in the Balance" highlight the seriousness of the public health problem caused by the increase in the prevalence of overweight and obese adults and youth (U.S. Department of Health and Human Services, 2001; Institute of Medicine Committee on Prevention of Obesity in Children and Youth, 2005). Studies have shown that being overweight or obese is strongly associated with increased morbidity and mortality among adults (Lakdawalla, Bhattacharya, & Goldman, 2004; Mokdad, Marks, Stroup, & Gerberding, 2004; Must et al., 1999; Sturm & Wells, 2001; Sturm, 2003). Others have suggested an association with decreased employment opportunities and income, as well (Cawley & Danziger, 2004; Sarlio-Lahteenkorva, Silventoinen, & Lahelma, 2004).

In addition, a growing body of research documents an increase in morbidity among overweight and obese youth (American Diabetes Association, 2000; Chu, Rimm, Wang, Liou, & Shieh, 1998; Dietz, 1998; Falkner, 1993; Freedman, Dietz, Srinivasan, & Berenson, 1999). Research also documents that obesity, morbidity, and mortality in adulthood are associated with being overweight in childhood and adolescence (Guo & Chumlea, 1999; Must, Jacques, Dallal, Bajema, & Dietz, 1992; Serdula et al., 1993).

A number of factors have been identified as potential precursors to obesity, though in many instances the associations are modest at best, and establishing causality has been elusive. Nonetheless, a comprehensive literature review on factors associated with increased risk of overweight and obesity suggests that these conditions can be explained best by a complex interaction of individual factors (e.g., individual food choices and activity levels or, conversely, sedentary lifestyle habits such as television viewing) and contextual factors (e.g., food

advertising and marketing, types of foods offered in schools) (Story, Neumark-Sztainer, & French, 2002). While some factors receive more publicity than others at various times, it has become increasingly clear that the complex interplay of multiple factors leads to an increase in overweight and obesity (Institute of Medicine Committee on Prevention of Obesity in Children and Youth, 2005; U.S. Department of Health and Human Services, 2001). Indeed, it is more likely that multiple-component interventions targeting multiple factors (e.g., media campaigns, school lunch changes, increased activity levels by individuals and families, as well as dietary choices) will result in more effective and long-lasting changes than interventions targeting a single behavior.

Overview of the Present Study

The present study builds upon the work of Johnston and O'Malley (2003), who document a substantial increase in the percent of overweight and obese youth in the past three decades in the United States. They also reveal a troublesome pattern of behaviors that may contribute to the increase in overweight and obesity. These trends include a substantial decrease in the percent of adolescents who eat breakfast, fruits, and vegetables on a regular basis, and a large increase in the proportion of adolescents who are not getting sufficient sleep at night (Johnston & O'Malley, 2003). With these findings in mind, the present study seeks to investigate whether the trends observed for the general population of adolescents vary according to their gender, racial/ethnic backgrounds, socioeconomic status, population density, and region of residence. We specifically focus on youth of White, Black, and Hispanic backgrounds because sample sizes for other racial/ethnic groups are too small to permit inferences about them. In this study we also conduct analyses intended to shed light on the relationship of these behaviors with BMI and the likelihood of being overweight.

METHODS

Samples and Survey Methods

This occasional paper utilizes data from 8th, 10th, and 12th graders who participated in the University of Michigan's Monitoring the Future project. The design and methods are summarized briefly below; more detailed descriptions are available elsewhere (Bachman, Johnston, & O'Malley, 2001; Johnston, O'Malley, Bachman, & Schulenberg, 2004). The study employs a multistage sampling design to obtain nationally representative samples of secondary school students (i.e., 8th, 10th, and 12th graders) from the 48 contiguous states. Data have been collected annually from 12th graders since 1975 and from 8th and 10th graders since 1991. The sampling procedures involve three stages (Kish, 1965): first, geographic regions are selected; second, schools are selected (without replacement)—approximately 420 each year; third, between 42,000 and 49,000 youths are sampled each year from within schools. Sample weights are assigned to each student to take into account school sample sizes, as well as any variations in selection probabilities that occurred at earlier stages of the sampling procedures. Students complete a self-administered, machine-readable questionnaire during a normal class period. Student response rates average around 90%, 86%, and 84% for 8th, 10th, and 12th graders, respectively. Absence on the day of data collection was the primary reason that students were missed; it is estimated that less than 1% of students refused to complete the questionnaire.

The analyses presented here focus on the samples of 8th- and 10th-grade youth who participated in the 1993–2003 surveys and of 12th-grade youth who participated in the 1986–2003 surveys. In the 1991 and 1992 surveys of 8th and 10th graders, the question that asked about the students' age differs from the question asked about age in subsequent years (1993–2003). Therefore, to ensure that the same question on age was used when calculating and comparing trends on BMI and its percentile, the analyses conducted in the present study are based on the 1993–2003 surveys of 8th and 10th graders.

The questions about height and weight (used to calculate BMI) were asked of a random half of the 8th- and 10th- grade students (on two of the four questionnaire forms used since 1997, and on one of the two questionnaire forms used prior to 1997). Sample sizes for the variables eating fruits and vegetables, exercising, and sleeping at least seven hours are smaller because these questions are asked of only one-third of the total sample since 1991. The question about computer use was added in 1997 and is also asked of one-third of the total sample of 8th and 10th graders. Sample sizes for the questions on time spent watching television are larger because these questions are asked on all forms in all years.

Questions about height and weight were not asked of 12th graders until 1986. Thus, the analyses are based on the 1986–2003 surveys of 12th graders. Also, because the questions of interest were included in only some of the multiple questionnaire forms used, the sample available for analysis is less than the total number surveyed. Data for 12th graders are based on one questionnaire form that includes the questions about height and weight (used to calculate BMI). Sample sizes for all the other variables (eating, exercising, sleeping, watching television, and computer use) are approximately the same size because these questions also are asked on only one questionnaire form among 12th graders (though on a different form than the height and weight questions). Because the BMI and habits measures are on different forms, analyses of associations between these variables cannot be done for 12th graders.

Results are presented in three-year intervals, with the exception of the two-year interval for the 1993–1994 period for 8th and 10th graders. These intervals were created to obtain a sufficiently large number of respondents to permit inferences regarding each of the population subgroups under study.

Measures

BMI and overweight. Age- and gender-specific growth curves produced by the Centers for Disease Control and Prevention (CDC) were used to create the "overweight" category, defined here as youth whose body mass index (BMI) was greater than or equal to the 85% percentile (Hammer, Kraemer, Wilson, Ritter, & Dornbusch, 1991; Pietrobelli et al., 1998). These growth curves were normed on data from several national health examination surveys conducted by the National Center for Health Statistics between 1963 and 1994. BMI was calculated by dividing weight (in kilograms) by height (in meters) squared: weight/height^2.

Eating habits. Three separate variables about eating habits were measured by asking the questions "How often do you eat breakfast?" "How often do you eat at least some green vegetables?" and "How often do you eat at least some fruit?" The response categories for each of these variables were "never," "seldom," "sometimes," "most days," "nearly every day," and

"every day." For a number of analyses conducted, we dichotomized students' responses to each of these questions into those who engage in the behavior regularly (every day or nearly every day) and those who do not engage in the behavior that frequently (those who answered "never," "seldom," "sometimes," or "most days").

Exercising habits. A variable on frequency of exercising was created using the following question: "How often do you exercise vigorously (jogging, swimming, calisthenics, or any other active sports)?" Again the response categories were "never," "seldom," "sometimes," "most days," "nearly every day," and "every day." As is the case with the eating habits variables, for several analyses we dichotomized students' responses into those who regularly (every day or nearly every day) exercise vigorously and those who do not.

Sleeping habits. A variable measuring how frequently youth sleep at least seven hours was created based on the question "How often do you get at least seven hours of sleep?" with response categories being "never," "seldom," "sometimes," "most days," "nearly every day," and "every day." Similarly, for several analyses, we dichotomized students' responses into those who report that they get at least seven hours of sleep every day or nearly every day and those who do not.

Sedentary activities: Television viewing and computer use. Three variables measuring television viewing were created. One variable corresponds to the average number of hours youth watch television on an average weekday in response to the following question: "How much TV do you estimate you watch on an average WEEKDAY?" with response categories of "none" (coded 0 hours), "half-hour or less" (0.5 hours), "about one hour" (1 hour), "about two hours" (2 hours), "about three hours" (3 hours), "about four hours" (4 hours), and "five hours or more" (5 hours). To estimate the number of hours youth watch TV on an average week, not including weekend, the daily figure was multiplied by five, leading to the following corresponding hours of TV viewed per week: 0, 2.5, 5, 10, 15, 20, and 25 hours.

A second variable of TV viewing corresponds to the number of hours youth watch television in an average weekend. The question used to create this variable is "How much TV do you estimate you watch on an average WEEKEND (both Saturday and Sunday combined)?" with response categories of "none" (coded 0 hours), "less than an hour" (0.5 hours), "1–2 hours" (1.5 hours), "3–4 hours" (3.5 hours), "5–6 hours" (5.5 hours), "7–8 hours" (7.5 hours), and "9 hours or more" (9.5 hours). Questions about weekend television viewing are not asked of 12th graders; thus, data on this variable are not available for this group of students.

The third TV-viewing variable corresponds to the number of hours youth watch TV the entire week, including weekdays and weekends. This variable was created by adding the number of hours youth watch TV in a week (5 days) and weekend, as defined above. A variable measuring total television viewing could not be calculated for 12th graders, because questions about weekend television viewing are not asked of 12th graders.

Computer use is defined as the number of hours youth spend using the computer each week. The question asks separately about the number of hours youth spend using a computer for school work, for work-related reasons, for a job, and for other things. For the present study, we

focused on computer use for "…doing other things." The response categories are "none" (coded 0 hours), "less than 1 hour" (0.5 hours), "1–2 hours" (1.5 hours), "3–5 hours" (4 hours), "6–9 hours" (7.5 hours), "10–19 hours" (14.5 hours), and "20 or more" (20 hours).

Demographic characteristics. The demographic variables included in this study are gender, racial/ethnic background, parental education, population density, and region. Gender is measured by the question "What is your sex?" with the response categories being 1 = male, 2 = female. Racial/ethnic group was measured by the question "How do you describe yourself?" The respondent is instructed to answer only one category. For the present study, racial/ethnic groups consisted of youth who described themselves as (1) White, (2) African American, or (3) Hispanic. Other groups are not included in the analyses here due to the small number of cases available.

Parental education (a proxy for socioeconomic status) is defined on the basis of father's and mother's educational attainment (with one missing data case permitted). Educational attainment for each, father and mother, is coded as follows: 1 = completed grade school or less, 2 = some high school, 3 = completed high school, 4 = some college, 5 = completed college, 6 = graduate or professional school after college. An ordinal measure of socioeconomic status (SES) (low, mid, and high) was created by combining the mother's and father's educational levels. Specifically, for students reporting two parents' education, low SES corresponds to students whose mother and father both have less than a high school education or one of them has a high school degree but the other parent does not. High SES corresponds to students whose mother and father have college degrees. Remaining students were coded as having mid-SES. For students reporting only one parent's education, low SES corresponds to students whose parent has a high school education or less; students whose parent has more than a high school education were coded as having mid-SES. No one-parent families were coded as high SES.

Population density is determined by the U.S. Census Bureau's classification of the area in which the school is located: within a large metropolitan statistical area (MSA), other metropolitan statistical area, or non-metropolitan statistical area. Region is determined by the geographical region of the country where the school is located (i.e., Northeast, North Central, South, and West).

Analytic Procedures

We examined differences in the distribution of the variables of interest (BMI, percent overweight, eating habits, exercise, sleeping habits, TV viewing, and computer use) according to racial/ethnic background, SES, population density, and region. The data were weighted to take into account design effects by calculating variance estimates with the STATA 8.0 statistical program (Stata Corporation, 2003). Analyses were stratified by gender because of the observed gender differences on these behaviors and conditions in the total sample and among subsamples. Specifically, two types of analyses were conducted on the data presented in Tables 4 through 34 for each interval.

First, a regression analysis with only one characteristic (race/ethnicity, SES, population density, or region) at a time was performed (OLS regression for Tables 4–6 and Tables 25–34 and logistic regression for all other tables) to determine if the responses to the dependent

variables vary within each of the study characteristics. For example, as shown in Table 4, second column (1993–1994 interval), a regression analysis was conducted to test if mean BMI significantly varied by the youth racial/ethnic backgrounds (White, Black, Hispanic) with White as the reference category. In this case, the mean BMI of Black males in 8th grade in the 1993–1994 years (M = 21.3, sd = 3.9) was significantly higher ($p < 0.001$) than that of White youth of the same gender and grade in the same years (M = 20.8, sd = 3.6). The asterisks represent the attained level of statistical significance. Regression coefficients are not included due to space limitations.

Similar analyses were done for each of the other three demographic variables, SES (low SES is the reference category), population density (large MSA is the reference category), and region (Northeast is the reference category).

Subsequently, to test if mean BMI varies in a multivariate context (i.e., controlling for the other variables in the set), we performed a multiple regression analysis that included all four variables (race/ethnicity, SES, population density, and region). The third column in Table 4 provides information on whether mean BMI is significantly different within a particular variable while statistically adjusting for the potential confounding effects of the other variables. For example, in a multivariate context, the mean BMI of Black males was significantly higher than that of White males though at a lower significance level ($p < 0.01$) than that obtained in the univariate context described above (see columns two and three in Table 4).

The same analytical approach was applied to all intervals included on all the tables. The only difference is that logistic and multiple logistic regression analyses were done to analyze the data in Tables 7–24 because the dependent variables are all dichotomous. Interpretation of these results follows the same logic as that described above. For these particular analyses, regression coefficients were converted into odds ratios but are not included due to space limitations, though they are available upon request. In Tables 35 and 36 the full distribution on the dependent variables are given, and thus differences in the distribution were tested using the chi-square statistic.

RESULTS

Sample Characteristics

Sample sizes for 8th and 10th graders at each of the intervals range from 11,881 to 17,074 youths and for 12th graders from 4,866 to 7,863 students. In general, the samples of 8th and 10th graders consisted of 48% males and 52% females, 74% White, 15% Black, and 11% Hispanic, though among 8th graders there is a slightly lower proportion of White youth than among 10th graders. The samples of 12th graders consist of 47% males and 53% females, about 80% White, 12% Black, and 8% Hispanic, though in recent years the samples include a larger percent of Black and Hispanic youth. The demographic distributions for all three grades are presented in Tables 1, 2 and 3.

Table 1. Weighted Sample Sizes by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994				1995-1997				1998-2000				2001-2003			
	M	***%***	***F***	***%***	***M***	***%***	***F***	***%***	***M***	***%***	***F***	***%***	***M***	***%***	**F**	**%**
Total N	5703	*48.0*	6178	*52.0*	8183	*47.9*	8891	*52.1*	8079	*48.0*	8759	*52.0*	7675	*46.9*	8688	*53.1*
Race/Ethnicity																
White	4131	*72.4*	4425	*71.6*	6129	*74.9*	6515	*73.2*	5952	*73.7*	6330	*72.3*	5628	*73.3*	6392	*73.6*
Black	935	*16.4*	1112	*18.0*	1121	*13.7*	1402	*15.8*	1141	*14.1*	1421	*16.2*	1065	*13.9*	1282	*14.8*
Hispanic	637	*11.2*	641	*10.4*	933	*11.4*	974	*11.0*	986	*12.2*	1008	*11.5*	982	*12.8*	1014	*11.6*
SES[a]																
Low SES	831	*15.4*	1120	*19.2*	1124	*15.0*	1516	*18.1*	992	*13.3*	1443	*17.5*	906	*12.8*	1293	*15.9*
Mid-SES	3082	*57.3*	3358	*57.4*	4386	*58.3*	4830	*57.8*	4196	*56.4*	4662	*56.5*	3991	*56.6*	4684	*57.4*
High SES	1467	*27.3*	1370	*23.4*	2018	*26.7*	2005	*24.1*	2250	*30.3*	2148	*26.0*	2161	*30.6*	2181	*26.7*
Pop. Density																
Large MSA	1229	*21.5*	1265	*20.5*	1743	*21.2*	1941	*21.7*	2034	*25.2*	2273	*26.0*	1994	*26.0*	2344	*27.0*
Other MSA	3011	*52.8*	3314	*53.6*	4137	*50.6*	4394	*49.5*	3919	*48.5*	4178	*47.7*	3643	*47.5*	4149	*47.8*
Non-MSA	1463	*25.7*	1599	*25.9*	2303	*28.2*	2556	*28.8*	2126	*26.3*	2308	*26.3*	2038	*26.5*	2195	*25.2*
Region																
Northeast	1010	*17.7*	1149	*18.6*	1347	*16.4*	1410	*15.7*	1325	*16.4*	1474	*16.8*	1331	*17.4*	1497	*17.2*
North Central	1504	*26.4*	1611	*26.1*	2246	*27.5*	2306	*26.0*	2020	*25.0*	2294	*26.2*	2117	*27.6*	2454	*28.3*
South	2116	*37.1*	2322	*37.6*	3065	*37.5*	3542	*39.9*	3204	*39.7*	3411	*39.0*	2957	*38.5*	3226	*37.1*
West	1073	*18.8*	1096	*17.7*	1525	*18.6*	1633	*18.4*	1530	*18.9*	1580	*18.0*	1270	*16.5*	1511	*17.4*

Note. ***M*** stands for males and ***F*** for females. Data for 8th graders are based on half of the sample (on two of four questionnaire forms since 1997, and on one of two forms prior to 1997) who were asked the questions about height and weight that served to calculate the BMI variable, the main variable of interest in the present report. The sample sizes for the variables about eating, exercising, and sleeping behaviors as well as computer usage are smaller because these questions are asked of only one-third of the sample. Sample sizes for the questions on time spent watching television are larger because these questions are asked on all four study forms.

[a]The sample sizes for SES do not add up to the total sample size of each, males and females, due to some missing data on parents' education.

Table 2. Weighted Sample Sizes by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994				1995-1997				1998-2000				2001-2003			
	M	***%***	***F***	***%***	***M***	***%***	***F***	***%***	***M***	***%***	***F***	***%***	***M***	***%***	**F**	**%**
Total N	5989	*48.5*	6354	*51.5*	8776	*48.4*	9362	*51.6*	8060	*47.8*	8801	*52.2*	8372	*47.7*	9185	*52.3*
Race/Ethnicity																
White	4892	*81.7*	5026	*79.1*	7102	*80.9*	7415	*79.2*	6120	*75.9*	6543	*74.4*	6192	*74.0*	6680	*72.7*
Black	567	*9.4*	744	*11.7*	844	*9.6*	1008	*10.8*	955	*11.9*	1174	*13.3*	1126	*13.4*	1319	*14.4*
Hispanic	530	*8.9*	584	*9.2*	830	*9.5*	939	*10.0*	985	*12.2*	1084	*12.3*	1054	*12.6*	1186	*12.9*
SES[a]																
Low SES	790	*13.7*	1168	*18.8*	1055	*12.5*	1532	*16.8*	1033	*13.3*	1575	*18.4*	1165	*14.6*	1530	*17.2*
Mid-SES	3588	*62.0*	3801	*61.2*	5202	*61.5*	5576	*61.3*	4712	*60.9*	4991	*58.5*	4789	*60.0*	5263	*59.3*
High SES	1403	*24.3*	1242	*20.0*	2206	*26.0*	1986	*21.9*	1994	*25.8*	1970	*23.1*	2035	*25.4*	2091	*23.5*
Pop. Density																
Large MSA	1072	*17.9*	1232	*19.4*	1724	*19.7*	1882	*20.1*	2017	*25.0*	2343	*26.6*	2356	*28.2*	2520	*27.4*
Other MSA	3178	*53.1*	3340	*52.6*	4758	*54.2*	4902	*52.4*	3858	*47.9*	4196	*47.7*	4122	*49.2*	4504	*49.1*
Non-MSA	1739	*29.0*	1782	*28.0*	2294	*26.1*	2578	*27.5*	2185	*27.1*	2262	*25.7*	1894	*22.6*	2161	*23.5*
Region																
Northeast	1022	*17.1*	1051	*16.5*	1677	*19.1*	1676	*17.9*	1434	*17.8*	1651	*18.8*	1527	*18.2*	1610	*17.5*
North Central	1942	*32.4*	2028	*31.9*	2309	*26.3*	2493	*26.6*	2161	*26.8*	2275	*25.8*	2328	*27.8*	2615	*28.5*
South	2013	*33.6*	2151	*33.9*	3367	*38.4*	3621	*38.7*	2926	*36.3*	3241	*36.8*	3006	*35.9*	3305	*36.0*
West	1012	*16.9*	1124	*17.7*	1423	*16.2*	1572	*16.8*	1539	*19.1*	1634	*18.6*	1511	*18.1*	1655	*18.0*

Note. ***M*** stands for males and ***F*** for females. Data for 10th graders are based on half of the sample (on two of four questionnaire forms since 1997, and on one of two forms prior to 1997) who were asked the questions about height and weight that served to calculate the BMI variable, the main variable of interest in the present report. The sample sizes for the variables about eating, exercising, and sleeping behaviors as well as computer usage are smaller because these questions are asked of only one-third of the sample.

[a]The sample sizes for the questions on time spent watching television are larger because these questions are asked on all four study forms.

Table 3. Weighted Sample Sizes by Demographic Subgroup, 12th Grade, 1986–2003

Grade 12

Characteristic	1986-1988				1989-1991				1992-1994			
	M	**%**	***F***	**%**	***M***	**%**	***F***	**%**	***M***	**%**	***F***	**%**
Total N	3705	*47.1*	4158	*52.9*	3000	*48.6*	3169	*51.4*	2777	*46.8*	3151	*53.2*
Race/Ethnicity												
White	3103	*83.8*	3425	*82.4*	2504	*83.5*	2494	*78.7*	2232	*80.4*	2435	*77.3*
Black	349	*9.4*	492	*11.8*	264	*8.8*	405	*12.8*	284	*10.2*	412	*13.1*
Hispanic	253	*6.8*	241	*5.8*	232	*7.7*	270	*8.5*	261	*9.4*	304	*9.6*
SES[a]												
Low SES	661	*18.2*	834	*20.4*	466	*15.8*	646	*20.8*	405	*14.8*	563	*18.2*
Mid-SES	2277	*62.7*	2541	*62.2*	1887	*63.9*	1940	*62.4*	1782	*65.0*	1942	*62.9*
High SES	693	*19.1*	712	*17.4*	598	*20.3*	522	*16.8*	553	*20.2*	583	*18.9*
Pop. Density												
Large MSA	820	*22.1*	1034	*24.9*	694	*23.1*	694	*21.9*	579	*20.8*	734	*23.3*
Other MSA	1779	*48.0*	1974	*47.5*	1539	*51.3*	1662	*52.5*	1383	*49.8*	1464	*46.5*
Non-MSA	1106	*29.9*	1150	*27.6*	767	*25.6*	813	*25.6*	815	*29.4*	953	*30.2*
Region												
Northeast	743	*20.0*	799	*19.2*	550	*18.3*	567	*17.9*	404	*14.6*	482	*15.3*
North Central	1063	*28.7*	1233	*29.6*	891	*29.7*	935	*29.5*	845	*30.4*	909	*28.9*
South	1200	*32.4*	1429	*34.4*	961	*32.0*	1153	*36.4*	1028	*37.0*	1194	*37.9*
West	699	*18.9*	697	*16.8*	598	*20.0*	514	*16.2*	500	*18.0*	566	*17.9*

Characteristic	1995-1997				1998-2000				2001-2003			
	M	**%**	***F***	**%**	***M***	**%**	***F***	**%**	***M***	**%**	***F***	**%**
Total N	2530	*46.8*	2876	*53.2*	2323	*47.7*	2552	*52.3*	2172	*44.6*	2694	*55.4*
Race/Ethnicity												
White	2050	*81.0*	2199	*76.5*	1824	*78.5*	1943	*76.2*	1709	*78.7*	1968	*73.1*
Black	243	*9.6*	404	*14.0*	289	*12.5*	373	*14.6*	217	*10.0*	373	*13.8*
Hispanic	237	*9.4*	273	*9.5*	210	*9.0*	236	*9.2*	246	*11.3*	353	*13.1*
SES[a]												
Low SES	303	*12.3*	439	*15.5*	253	*11.2*	415	*16.5*	307	*14.5*	428	*16.2*
Mid-SES	1575	*63.6*	1753	*62.0*	1467	*64.9*	1573	*62.6*	1301	*61.6*	1615	*61.3*
High SES	597	*24.1*	635	*22.5*	541	*23.9*	525	*20.9*	505	*23.9*	593	*22.5*
Pop. Density												
Large MSA	647	*25.6*	728	*25.3*	605	*26.0*	656	*25.7*	591	*27.2*	763	*28.3*
Other MSA	1159	*45.8*	1381	*48.0*	1073	*46.2*	1178	*46.2*	982	*45.2*	1196	*44.4*
Non-MSA	724	*28.6*	767	*26.7*	645	*27.8*	718	*28.1*	599	*27.6*	735	*27.3*
Region												
Northeast	441	*17.5*	519	*18.0*	337	*14.5*	438	*17.1*	392	*18.1*	425	*15.8*
North Central	759	*30.0*	795	*27.7*	676	*29.1*	648	*25.4*	596	*27.4*	765	*28.4*
South	896	*35.4*	1078	*37.5*	834	*35.9*	998	*39.1*	739	*34.0*	1031	*38.3*
West	434	*17.1*	484	*16.8*	476	*20.5*	468	*18.4*	445	*20.5*	473	*17.5*

Note. ***M*** stands for males and ***F*** for females. Data for 12th graders are based on one study form asking the questions about height and weight that served to calculate the BMI variable. Sample sizes for the all the other variables (eating, exercising, sleeping, watching television, and computer usage) are approximately the same size, as these questions also are asked on only one study form.

[a]The sample sizes for SES do not add up to the total sample size of each, males and females, due to some missing data on parents' education.

Body Mass Index

Racial/ethnic differences. The Body Mass Index (BMI) among 8th- and 10th-grade males and females has been significantly higher among Black and Hispanic youth when compared to White youth from the early 1990s through the 2001–2003 years, the exception being the bivariate differences between 8th-grade Black and White males in 1995–1997 and 1998–2000 (see Tables 4 and 5). For the most part, differences in BMI between Black and Hispanic male students are minimal; but Hispanic females tend to average slightly lower in BMI than Black females.

Among 12th graders, White students, both male and female, have the lowest mean BMI in all six three-year intervals, though the differences are not always statistically significant among the male students (Table 6). Similar to the 8th and 10th graders, differences between Black and Hispanic male students are minimal, while Hispanic females tend to average slightly lower than Black females.

SES differences. There is an ordinal relationship between SES and BMI among 8th-, 10th-, and 12th-grade males and females (see Tables 4, 5, and 6), with BMI declining with each step up in SES. For the most part, these associations are statistically significant.

Population density and regional differences. In general, there are no consistent patterns in the distribution of BMI by population density and region among 8th, 10th, and 12th graders of both genders (see Tables 4 and 5). There is a tendency for BMI to be slightly higher among the non-MSAs, compared to the MSAs (both the large MSAs and other MSAs), although the differences are generally not statistically significant. There is also a tendency for the Western region of the country to be lowest, and the South highest, though again the differences are often not significant.

Table 4. Mean BMI: Differences and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994 M (sdev)	Mult[a]	1995-1997 M (sdev)	Mult[a]	1998-2000 M (sdev)	Mult[a]	2001-2003 M (sdev)	Mult[a]
Total Males	21.0 (3.7)		21.2 (3.9)		21.5 (4.2)		21.6 (4.4)	
Race/Ethnicity								
White	20.8 (3.6)	Ref	21.1 (3.8)	Ref	21.4 (4.1)	Ref	21.3 (4.2)	Ref
Black	21.3 (3.9)***	**	21.5 (4.3)	*	21.6 (4.3)		22.3 (4.9)***	***
Hispanic	21.6 (4.4)***	***	21.7 (4.4)**	*	22.0 (4.6)**	*	22.2 (4.8)***	**
SES								
Low SES	21.3 (4.1)	Ref	21.8 (4.2)	Ref	22.0 (4.6)	Ref	22.6 (5.2)	Ref
Mid-SES	21.1 (3.7)		21.4 (4.0)*		21.7 (4.2)		21.7 (4.3)***	***
High SES	20.4 (3.3)***	**	20.5 (3.5)***	***	20.9 (3.8)***	***	20.8 (3.9)***	***
Pop. Density								
Large MSA	20.8 (3.6)	Ref	21.0 (4.0)	Ref	21.3 (4.0)	Ref	21.5 (4.4)	Ref
Other MSA	21.0 (3.8)	*	21.2 (3.8)**	*	21.5 (4.2)		21.4 (4.3)	
Non-MSA	21.0 (3.9)		21.5 (4.0)	**	21.8 (4.3)*		22.0 (4.5)**	**
Region								
Northeast	20.8 (3.4)	Ref	21.0 (3.7)	Ref	21.6 (4.1)	Ref	21.6 (4.3)	Ref
North Central	20.9 (3.6)		21.4 (3.9)		21.4 (4.3)	*	21.4 (4.3)	
South	21.2 (4.0)*		21.3 (4.1)		21.7 (4.3)		21.8 (4.6)	
West	20.5 (3.5)	*	20.8 (3.7)		21.3 (4.0)*	**	21.3 (4.3)	*
Total Females	20.9 (3.9)		20.9 (3.9)		20.9 (4.0)		21.1 (4.1)	
Race/Ethnicity								
White	20.5 (3.6)	Ref	20.6 (3.6)	Ref	20.5 (3.8)	Ref	20.7 (3.9)	Ref
Black	22.1 (4.5)***	***	22.5 (4.8)***	***	22.3 (4.8)***	***	22.5 (4.8)***	***
Hispanic	21.8 (4.1)***	***	21.3 (4.0)***	**	21.5 (4.1)***	***	21.7 (4.4)***	***
SES								
Low SES	21.7 (4.4)	Ref	21.8 (4.2)	Ref	21.9 (4.6)	Ref	22.0 (4.7)	Ref
Mid-SES	20.9 (3.8)***	***	21.0 (3.9)***	***	21.0 (4.1)***	***	21.2 (4.2)***	***
High SES	20.1 (3.2)***	***	20.1 (3.4)***	***	20.1 (3.3)***	***	20.1 (3.5)***	***
Pop. Density								
Large MSA	20.7 (3.7)	Ref	21.0 (3.9)	Ref	20.9 (3.8)	Ref	21.1 (4.1)	Ref
Other MSA	20.8 (3.7)		20.8 (3.8)		20.8 (4.0)		21.0 (4.1)	
Non-MSA	21.3 (4.3)*	**	21.2 (4.1)		21.2 (4.4)	*	21.3 (4.3)	*
Region								
Northeast	20.5 (3.5)	Ref	20.6 (3.5)	Ref	20.7 (3.7)	Ref	20.9 (4.1)	Ref
North Central	21.0 (3.9)*		21.1 (4.0)*		21.0 (4.1)		21.1 (4.0)	
South	21.3 (4.2)**		21.1 (4.1)**		21.2 (4.3)**		21.3 (4.4)	
West	20.5 (3.5)		20.6 (3.6)		20.5 (3.5)	*	20.6 (3.7)	*

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 5. Mean BMI: Differences and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994 M (sdev)	Mult[a]	1995-1997 M (sdev)	Mult[a]	1998-2000 M (sdev)	Mult[a]	2001-2003 M (sdev)	Mult[a]
Total Males	22.5 (3.6)		22.6 (3.7)		22.9 (4.0)		23.1 (4.2)	
Race/Ethnicity								
White	22.3 (3.5)	Ref	22.5 (3.6)	Ref	22.7 (3.9)	Ref	22.9 (4.0)	Ref
Black	23.3 (3.9)***	***	23.1 (4.1)**	*	23.1 (4.1)*		23.5 (4.2)***	***
Hispanic	22.8 (3.9)***		23.1 (4.1)**		23.7 (4.6)***	**	23.7 (4.8)***	***
SES								
Low SES	23.2 (3.9)	Ref	23.3 (4.2)	Ref	23.6 (4.5)	Ref	23.8 (4.6)	Ref
Mid-SES	22.5 (3.6)***	**	22.7 (3.7)***	**	23.0 (4.0)**	*	23.2 (4.2)**	*
High SES	21.9 (3.1)***	***	22.2 (3.4)***	***	22.3 (3.6)***	***	22.4 (3.6)***	***
Pop. Density								
Large MSA	22.2 (3.5)	Ref	22.5 (3.6)	Ref	22.8 (4.0)	Ref	22.8 (4.0)	Ref
Other MSA	22.4 (3.5)		22.6 (3.7)		22.8 (4.0)		23.2 (4.2)*	*
Non-MSA	22.7 (3.8)*	*	22.7 (3.9)		23.2 (4.1)**	*	23.2 (4.1)*	*
Region								
Northeast	22.3 (3.5)	Ref	22.5 (3.6)	Ref	22.8 (3.9)	Ref	22.9 (4.0)	Ref
North Central	22.3 (3.4)		22.6 (3.7)		22.8 (3.8)		23.0 (4.0)	
South	22.8 (3.7)*		22.8 (3.9)*		23.0 (4.2)		23.2 (4.3)	
West	22.2 (3.8)		22.4 (3.7)		22.8 (4.1)	*	23.1 (4.3)	
Total Females	21.7 (3.8)		21.7 (3.8)		21.9 (4.0)		22.3 (4.2)	
Race/Ethnicity								
White	21.4 (3.6)	Ref	21.4 (3.6)	Ref	21.6 (3.8)	Ref	21.9 (3.9)	Ref
Black	23.1 (4.4)***	***	23.0 (4.5)***	***	23.3 (4.7)***	***	23.7 (4.7)***	***
Hispanic	22.0 (4.0)**		22.6 (4.4)***	***	22.7 (4.2)***	***	23.5 (4.8)***	***
SES								
Low SES	22.3 (4.2)	Ref	22.6 (4.4)	Ref	22.9 (4.6)	Ref	22.9 (4.6)	Ref
Mid-SES	21.6 (3.8)***	***	21.6 (3.7)***	***	21.9 (4.0)***	***	22.4 (4.3)**	
High SES	21.0 (3.2)***	***	21.1 (3.4)***	***	21.1 (3.4)***	***	21.6 (3.5)***	***
Pop. Density								
Large MSA	21.8 (3.8)	Ref	21.5 (3.7)	Ref	22.0 (4.0)	Ref	22.3 (4.1)	Ref
Other MSA	21.6 (3.8)		21.7 (3.8)		21.8 (3.9)		22.4 (4.3)	
Non-MSA	21.8 (3.8)		21.7 (3.9)		22.1 (4.2)		22.3 (4.2)	
Region								
Northeast	21.8 (3.8)	Ref	21.6 (3.7)	Ref	21.9 (3.9)	Ref	22.3 (4.0)	Ref
North Central	21.5 (3.6)		21.5 (3.7)		21.7 (3.9)		22.0 (4.1)	**
South	21.8 (3.9)	**	21.8 (4.0)	*	22.2 (4.3)		22.5 (4.4)	
West	21.6 (3.8)	*	21.7 (3.9)		21.7 (3.7)	***	22.5 (4.4)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 6. Mean BMI: Differences and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Grade 12

Characteristic	1986-1988	Mult[a]	1989-1991	Mult[a]	1992-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	22.8 (3.0)		22.9 (3.3)		23.2 (3.3)		23.4 (3.6)		23.7 (3.6)		23.7 (3.9)	
Race/Ethnicity												
White	22.7 (3.0)	Ref	22.8 (3.3)	Ref	23.1 (3.3)	Ref	23.3 (3.5)	Ref	23.5 (3.5)	Ref	23.7 (3.9)	Ref
Black	23.5 (3.1)***	***	23.2 (3.1)		23.6 (3.6)		24.0 (3.6)**	**	24.1 (3.7)	*	23.8 (3.6)	
Hispanic	23.3 (3.4)*	*	23.3 (3.7)		23.8 (3.7)*	*	23.9 (3.8)*		24.3 (4.2)		24.0 (4.1)	
SES												
Low SES	23.1 (3.2)	Ref	23.5 (3.6)	Ref	23.8 (3.8)	Ref	23.8 (3.8)	Ref	24.4 (4.2)	Ref	24.3 (4.3)	Ref
Mid-SES	22.8 (3.1)		22.8 (3.3)**	**	23.2 (3.3)*		23.6 (3.6)		23.7 (3.6)*		23.7 (3.8)	
High SES	22.6 (2.7)*		22.6 (3.1)***	**	22.9 (3.0)**	*	22.8 (3.2)***	**	23.1 (3.4)**	*	23.5 (3.6)*	
Pop. Density												
Large MSA	22.6 (2.9)	Ref	22.9 (3.2)	Ref	23.0 (3.0)	Ref	23.4 (3.6)	Ref	23.5 (3.4)	Ref	23.5 (3.5)	Ref
Other MSA	22.8 (3.1)	*	23.0 (3.3)		23.2 (3.4)		23.4 (3.6)		23.4 (3.5)		23.7 (3.9)	
Non-MSA	22.8 (3.0)		22.8 (3.4)		23.4 (3.4)		23.4 (3.5)		24.2 (3.9)*	*	23.9 (4.1)	
Region												
Northeast	22.9 (3.0)	Ref	23.1 (3.2)	Ref	23.6 (3.4)	Ref	23.4 (3.4)	Ref	23.9 (3.6)	Ref	24.4 (4.3)	Ref
N. Central	22.8 (3.1)		22.7 (3.3)		23.1 (3.2)*		23.3 (3.6)		24.0 (3.5)		23.8 (3.8)	
South	22.8 (3.1)		23.1 (3.5)		23.3 (3.4)	*	23.7 (3.8)		23.5 (3.8)	*	23.5 (3.7)*	**
West	22.5 (2.9)*	*	22.8 (3.1)		23.0 (3.3)*	**	23.2 (3.2)		23.3 (3.4)	*	23.6 (3.7)	*
Total Females	21.4 (3.3)		21.7 (3.6)		22.1 (3.9)		22.3 (3.9)		22.7 (4.2)		22.7 (4.1)	
Race/Ethnicity												
White	21.2 (3.2)	Ref	21.4 (3.4)	Ref	21.7 (3.5)	Ref	22.0 (3.6)	Ref	22.3 (3.9)	Ref	22.4 (4.0)	Ref
Black	22.5 (3.7)***	***	23.0 (4.3)***	***	24.2 (4.6)***	***	23.4 (4.6)***	***	24.2 (5.0)***	***	24.0 (4.6)***	***
Hispanic	22.2 (3.9)**	*	22.4 (4.2)**	*	22.8 (4.2)**	*	22.9 (3.9)**	*	23.8 (4.8)***	***	22.9 (4.0)	
SES												
Low SES	21.9 (3.7)	Ref	22.4 (4.2)	Ref	22.7 (4.1)	Ref	23.1 (4.4)	Ref	23.5 (4.7)	Ref	23.4 (4.6)	Ref
Mid-SES	21.4 (3.3)**	*	21.7 (3.6)**	*	22.1 (3.9)*		22.2 (3.8)**	*	22.8 (4.2)**		22.7 (4.1)*	*
High SES	21.0 (2.8)***	**	20.9 (2.9)***	***	21.4 (3.0)***	**	21.8 (3.4)***	**	21.8 (3.4)***	**	22.1 (3.6)***	**
Pop. Density												
Large MSA	21.3 (3.2)	Ref	21.8 (3.6)	Ref	22.0 (3.8)	Ref	22.3 (3.9)	Ref	22.9 (4.3)	Ref	22.7 (4.0)	Ref
Other MSA	21.4 (3.3)		21.7 (3.7)		22.2 (3.8)		22.2 (3.8)		22.3 (4.1)		22.7 (4.1)	
Non-MSA	21.6 (3.4)	*	21.8 (3.5)		22.1 (4.0)		22.4 (4.0)		23.0 (4.2)		22.6 (4.3)	
Region												
Northeast	21.5 (3.1)	Ref	21.6 (3.3)	Ref	22.2 (3.8)	Ref	22.5 (4.0)	Ref	22.3 (3.7)	Ref	22.6 (4.0)	Ref
N. Central	21.6 (3.4)		21.9 (3.7)		22.0 (3.7)		22.2 (3.7)		22.8 (4.0)		22.6 (4.2)	
South	21.4 (3.5)		21.8 (3.9)		22.3 (4.2)		22.4 (4.1)	*	22.8 (4.5)		22.7 (4.1)	
West	21.1 (2.9)*	*	21.4 (3.2)		21.9 (3.5)		22.0 (3.4)*	***	22.7 (4.2)		22.9 (4.1)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Overweight

As described in the Methods section, overweight youth were defined as those whose BMI was at or above the 85th percentile using the CDC age- and gender-specific curves. If there had been no increase in BMI in recent years, then we would expect about 15% to be classified as overweight. As the data in Tables 7, 8, and 9 show, however, that is clearly not the case. For a graphic representation of these results by gender, race/ethnicity, and grade, see Figures 1 and 2, respectively. In the most recent three-year interval (2001–2003), over 30% of 8th- and 10th-grade males and 27% of 12th-grade males, were classified as overweight. Among females, the corresponding figures were lower: 21%, 22%, and 19%, respectively, but still higher than 15% and also higher than they were in earlier intervals for which we have measurement. (Note that some of this gender difference may be explainable in terms of more underestimation of weight by females when weight is self-reported. Gender differences of this magnitude are not seen in the CDC data that are based on actual measurement by another person; see Ogden, Fryar, Carroll, & Flegal, 2004). In the Study Limitations section we discuss in greater detail the bias associated with calculating body mass index and classifying youth as overweight when using self-reported height and weight.

Racial/ethnic differences. Among 8th-grade males, the highest percent overweight is found among Hispanic youth across all years (see Tables 7 and 8). In the most recent years (2001–2003) the percent of Black 8th-grade males has been significantly higher than that of White males (though still lower than that of Hispanic males; see Table 7). The rankings have been different for 8th-grade females. The greatest percent overweight is found among Black females, followed by Hispanic females, across all years.

Among 10th-grade males, the greatest proportion of overweight youth is also found among Hispanics in nearly all years, with the exception of the 1993–1994 interval, when the proportion of overweight Blacks was slightly higher. The percent of Black males who are overweight also has been significantly higher than that of White males across all years (see Table 8). Among 10th-grade females, however, the highest proportion overweight is found among Black females, followed by Hispanic females, across all years (see Table 8).

Among 12th-grade males, the highest proportion overweight is found among Hispanics, though in the most recent period (2001–2003) the racial/ethnic differences are not statistically significant (see Table 9). (The number of cases is much smaller for 12th graders than for 8th and 10th, so differences need to be larger to achieve statistical significance.) Among 12th-grade females, the greatest proportions of Black females have been overweight, followed by Hispanic and then White females across all years. (In the most recent period, 2001–2003, the proportion of overweight Hispanic females was not statistically different from that of White females.)

In sum, at all grades the highest proportions overweight generally have been found among Hispanic males and Black females. Overall, Whites have shown the lowest proportion overweight in all three grades, and among females it has tended to be by a considerable margin.

SES differences. SES is consistently negatively related to being overweight among 8th and 10th graders (see Tables 7 and 8). Interestingly, SES differences in the proportion of overweight have become larger and more statistically significant among males over time.

The proportion of overweight youth in 12th grade follows a similar pattern to that of 8th and 10th graders (see Table 9), with a significantly greater percent of overweight males and females among youth of low SES. One difference from the pattern in younger grades is the lack of statistically significant differences observed among males in the most recent period (2001–2003; see Table 9).

Population density and regional differences. Consistent with the pattern of finding with BMI, non-MSAs tend to have the highest proportion of overweight students, though the differences often are not significant and are not always consistent in all time periods. Also consistent with the pattern for BMI, the Western region of the country tends to have the lowest, and the South highest, proportion of overweight students, though the differences are generally not significant and are not always consistent.

Table 7. Percent Overweight (BMI percentile ≥ 85%): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Characteristic	Grade 8							
	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	24.3 (.01)		26.0 (.01)		29.8 (.01)		30.0 (.01)	
Race/Ethnicity								
White	23.0 (.01)	Ref	25.4 (.01)	Ref	28.6 (.01)	Ref	28.1 (.01)	Ref
Black	24.8 (.01)		26.1 (.02)		30.5 (.02)		34.9 (.02)***	**
Hispanic	31.7 (.02)***	***	29.9 (.02)*		36.2 (.02)***	**	35.3 (.02)**	*
SES								
Low SES	25.7 (.02)	Ref	30.7 (.02)	Ref	34.2 (.02)	Ref	39.6 (.02)	Ref
Mid- SES	25.0 (.01)		27.9 (.01)		31.6 (.01)		31.1 (.01)***	***
High SES	21.1 (.01)*		19.7 (.01)***	***	23.7 (.01)***	***	22.7 (.01)***	***
Pop. Density								
Large MSA	22.7 (.02)	Ref	24.8 (.01)	Ref	29.0 (.01)	Ref	28.6 (.01)	Ref
Other MSA	24.8 (.01)		25.0 (.01)		29.4 (.01)		28.1 (.01)	
Non-MSA	24.5 (.01)		28.7 (.02)		31.4 (.02)		34.6 (.01)***	**
Region								
Northeast	24.8 (.02)	Ref	24.8 (.02)	Ref	29.9 (.01)	Ref	31.1 (.02)	Ref
North Central	23.9 (.01)		28.2 (.01)		28.2 (.01)	*	27.7 (.02)	*
South	26.3 (.01)		26.9 (.01)		31.9 (.01)		31.9 (.01)	
West	20.2 (.02)	**	22.0 (.02)		27.4 (.01)		28.2 (.01)	*
Total Females	19.6 (.01)		20.0 (.01)		20.6 (.01)		21.1 (.01)	
Race/Ethnicity								
White	15.7 (.01)	Ref	16.5 (.01)	Ref	17.3 (.01)	Ref	18.0 (.01)	Ref
Black	29.7 (.02)***	***	33.2 (.02)***	***	31.6 (.02)***	***	32.2 (.01)***	***
Hispanic	29.5 (.03)***	***	24.2 (.02)***	***	25.4 (.02)***	**	26.7 (.02)***	***
SES								
Low SES	28.2 (.02)	Ref	28.0 (.02)	Ref	28.8 (.02)	Ref	28.4 (.01)	Ref
Mid-SES	18.9 (.01)***	**	20.2 (.01)***	***	20.6 (.01)***	***	22.1 (.01)***	***
High SES	13.3 (.01)***	***	13.5 (.01)***	***	14.1 (.01)***	***	14.4 (.01)***	***
Pop. Density								
Large MSA	18.0 (.02)	Ref	21.1 (.01)	Ref	20.4 (.01)	Ref	21.0 (.01)	Ref
Other MSA	18.0 (.01)		18.2 (.01)		19.9 (.01)		20.6 (.01)	
Non-MSA	24.2 (.02)*	**	22.3 (.01)		22.0 (.02)		22.3 (.01)	*
Region								
Northeast	15.4 (.02)	Ref	17.7 (.02)	Ref	17.8 (.01)	Ref	20.3 (.02)	Ref
North Central	19.7 (.01)*		21.0 (.01)		21.0 (.01)		20.5 (.01)	
South	23.1 (.02)**		21.8 (.01)*		22.4 (.01)*		23.2 (.01)	
West	16.4 (.02)		16.7 (.01)		18.7 (.01)		18.6 (.01)	

Note: In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 8. Percent Overweight (BMI percentile ≥ 85%): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	25.4 (.01)		27.6 (.01)		29.7 (.01)		31.6 (.01)	
Race/Ethnicity								
White	24.2 (.01)	Ref	26.2 (.01)	Ref	27.8 (.01)	Ref	29.7 (.01)	Ref
Black	30.8 (.02)**	*	32.5 (.02)**	*	31.9 (.02)*		34.5 (.02)*	*
Hispanic	30.5 (.02)**		34.2 (.02)***	**	39.1 (.03)***	***	39.8 (.02)***	***
SES								
Low SES	32.7 (.02)	Ref	32.3 (.02)	Ref	36.1 (.02)	Ref	40.0 (.02)	Ref
Mid-SES	25.6 (.01)**	*	28.5 (.01)		30.9 (.01)*		32.5 (.01)***	*
High SES	19.2 (.01)***	***	22.6 (.01)***	***	23.2 (.01)***	***	24.5 (.01)***	***
Pop. Density								
Large MSA	22.5 (.02)	Ref	25.3 (.01)	Ref	29.0 (.01)	Ref	28.7 (.01)	Ref
Other MSA	24.9 (.01)		28.0 (.01)	*	29.0 (.01)		32.9 (.01)*	*
Non-MSA	28.0 (.02)*	*	28.4 (.01)*		31.6 (.01)		32.4 (.01)*	
Region								
Northeast	24.2 (.02)	Ref	25.2 (.01)	Ref	29.5 (.01)	Ref	30.5 (.01)	Ref
North Central	23.6 (.01)		26.6 (.01)		28.1 (.02)		29.9 (.01)	
South	28.7 (.01)*		30.2 (.01)***	*	31.3 (.02)		33.1 (.02)	
West	23.3 (.02)		25.8 (.01)		29.1 (.01)	*	32.5 (.02)	
Total Females	16.1 (.01)		16.9 (.01)		18.4 (.01)		21.9 (.01)	
Race/Ethnicity								
White	13.9 (.01)	Ref	14.7 (.01)	Ref	15.7 (.01)	Ref	17.8 (.01)	Ref
Black	28.9 (.02)***	***	28.1 (.01)***	***	28.7 (.01)***	***	33.8 (.01)***	***
Hispanic	18.5 (.01)**		22.1 (.02)***	**	23.3 (.02)***	***	31.7 (.02)***	***
SES								
Low SES	20.4 (.01)	Ref	24.2 (.02)	Ref	26.0 (.01)	Ref	27.8 (.01)	Ref
Mid-SES	16.2 (.01)*		16.6 (.01)***	***	18.3 (.01)***	***	22.8 (.01)***	
High SES	11.5 (.01)***	***	11.7 (.01)***	***	11.8 (.01)***	***	14.4 (.01)***	***
Pop. Density								
Large MSA	17.9 (.02)	Ref	14.9 (.01)	Ref	17.8 (.01)	Ref	21.8 (.01)	Ref
Other MSA	14.9 (.01)		17.4 (.01)		17.7 (.01)		21.8 (.01)	
Non-MSA	16.9 (.01)		17.3 (.01)		20.2 (.01)	*	22.2 (.01)	
Region								
Northeast	16.3 (.01)	Ref	15.9 (.01)	Ref	17.9 (.01)	Ref	20.6 (.01)	Ref
North Central	14.6 (.01)		15.7 (.01)		17.0 (.01)		18.9 (.01)	
South	18.0 (.01)		18.6 (.01)		20.8 (.01)		24.3 (.01)*	
West	14.8 (.01)		15.8 (.01)		15.8 (.02)	***	23.2 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 9. Percent Overweight (BMI percentile ≥ 85%): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Characteristic	Grade 12											
	1986-1988	Mult[a]	1989-1991	Mult[a]	1992-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)		% (se)		% (se)	
Total Males	16.0 (.01)		18.5 (.01)		21.3 (.01)		23.4 (.01)		26.9 (.01)		26.6 (.01)	
Race/Ethnicity												
White	15.3 (.01)	Ref	17.7 (.01)	Ref	20.0 (.01)	Ref	22.4 (.01)	Ref	25.9 (.01)	Ref	26.2 (.01)	Ref
Black	20.2 (.02)*		21.9 (.03)		22.2 (.03)		27.0 (.03)		27.5 (.03)		26.3 (.03)	
Hispanic	20.1 (.03)		22.7 (.03)*		31.6 (.05)**	**	28.7 (.04)		34.8 (.04)*	*	29.7 (.03)	
SES												
Low SES	18.3 (.02)	Ref	25.4 (.03)	Ref	26.3 (.03)	Ref	29.6 (.03)	Ref	36.4 (.04)	Ref	30.2 (.03)	Ref
Mid-SES	16.7 (.01)		17.5 (.01)**	**	21.8 (.01)		24.2 (.01)		27.6 (.01)*	*	26.7 (.01)	
High SES	12.2 (.01)**	*	16.2 (.02)**	*	15.6 (.02)**	*	17.5 (.02)***	**	20.8 (.02)***	**	23.4 (.02)	
Pop. Density												
Large MSA	15.5 (.01)	Ref	17.6 (.01)	Ref	17.6 (.02)	Ref	24.5 (.01)	Ref	25.0 (.03)	Ref	23.7 (.02)	Ref
Other MSA	16.4 (.01)		19.2 (.01)		22.6 (.02)*		23.1 (.02)		24.9 (.01)		27.3 (.01)	
Non-MSA	15.8 (.02)		17.8 (.02)		21.7 (.02)		23.0 (.02)		32.0 (.02)		28.2 (.02)	
Region												
Northeast	17.3 (.02)	Ref	17.9 (.02)	Ref	23.3 (.03)	Ref	21.9 (.02)	Ref	29.6 (.02)	Ref	28.7 (.03)	Ref
North Central	15.9 (.02)		16.3 (.01)		19.9 (.02)		21.1 (.02)		29.4 (.02)		28.6 (.01)	
South	16.7 (.01)		21.6 (.01)		22.7 (.02)		26.9 (.02)		25.7 (.02)		25.5 (.02)	
West	13.8 (.01)	*	17.2 (.02)		19.3 (.02)		21.9 (.02)		23.5 (.03)		23.7 (.02)	
Total Females	9.9 (.01)		12.2 (.01)		15.3 (.01)		15.4 (.01)		19.1 (.01)		18.5 (.01)	
Race/Ethnicity												
White	8.7 (.01)	Ref	10.8 (.01)	Ref	12.2 (.01)	Ref	12.8 (.01)	Ref	15.6 (.01)	Ref	16.6 (.01)	Ref
Black	17.1 (.02)***	***	18.2 (.02)**	**	30.9 (.03)***	***	24.9 (.02)***	***	31.4 (.02)***	***	27.8 (.03)***	**
Hispanic	13.3 (.03)*	*	15.8 (.02)**		19.2 (.02)**	**	22.2 (.03)**	*	28.0 (.04)**	**	19.3 (.03)	
SES												
Low SES	11.8 (.02)	Ref	17.1 (.02)	Ref	18.6 (.02)	Ref	23.3 (.03)	Ref	27.6 (.03)	Ref	24.9 (.03)	Ref
Mid-SES	10.4 (.01)		11.7 (.01)**	*	16.0 (.01)		14.1 (.01)***	**	19.7 (.01)*		18.9 (.01)*	
High SES	6.6 (.01)*		6.4 (.01)***	***	8.8 (.02)**	*	11.5 (.01)***	**	10.3 (.01)***	***	12.7 (.02)***	***
Pop. Density												
Large MSA	8.3 (.01)	Ref	14.1 (.02)	Ref	14.9 (.02)	Ref	16.3 (.01)	Ref	19.7 (.02)	Ref	18.5 (.02)	Ref
Other MSA	9.9 (.01)		11.6 (.01)		14.5 (.01)		15.0 (.02)		17.1 (.01)		17.9 (.02)	
Non-MSA	11.6 (.01)*	*	11.7 (.02)		16.7 (.03)		15.5 (.02)		21.6 (.02)		19.3 (.01)	
Region												
Northeast	9.4 (.01)	Ref	10.5 (.02)	Ref	15.8 (.02)	Ref	17.0 (.01)	Ref	16.0 (.03)	Ref	15.5 (.02)	Ref
North Central	10.7 (.01)		13.8 (.01)		12.5 (.01)		13.6 (.02)		19.3 (.02)		17.7 (.02)	
South	11.2 (.01)		12.8 (.01)		19.2 (.02)		17.5 (.02)		20.7 (.01)		19.3 (.01)	
West	6.6 (.01)		9.5 (.01)		11.0 (.02)*	*	12.2 (.02)*	**	18.0 (.03)		20.5 (.03)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 1. Percent Overweight (BMI percentile ≥ 85%) by Gender, Race/Ethnicity, and Grade: 2001–2003

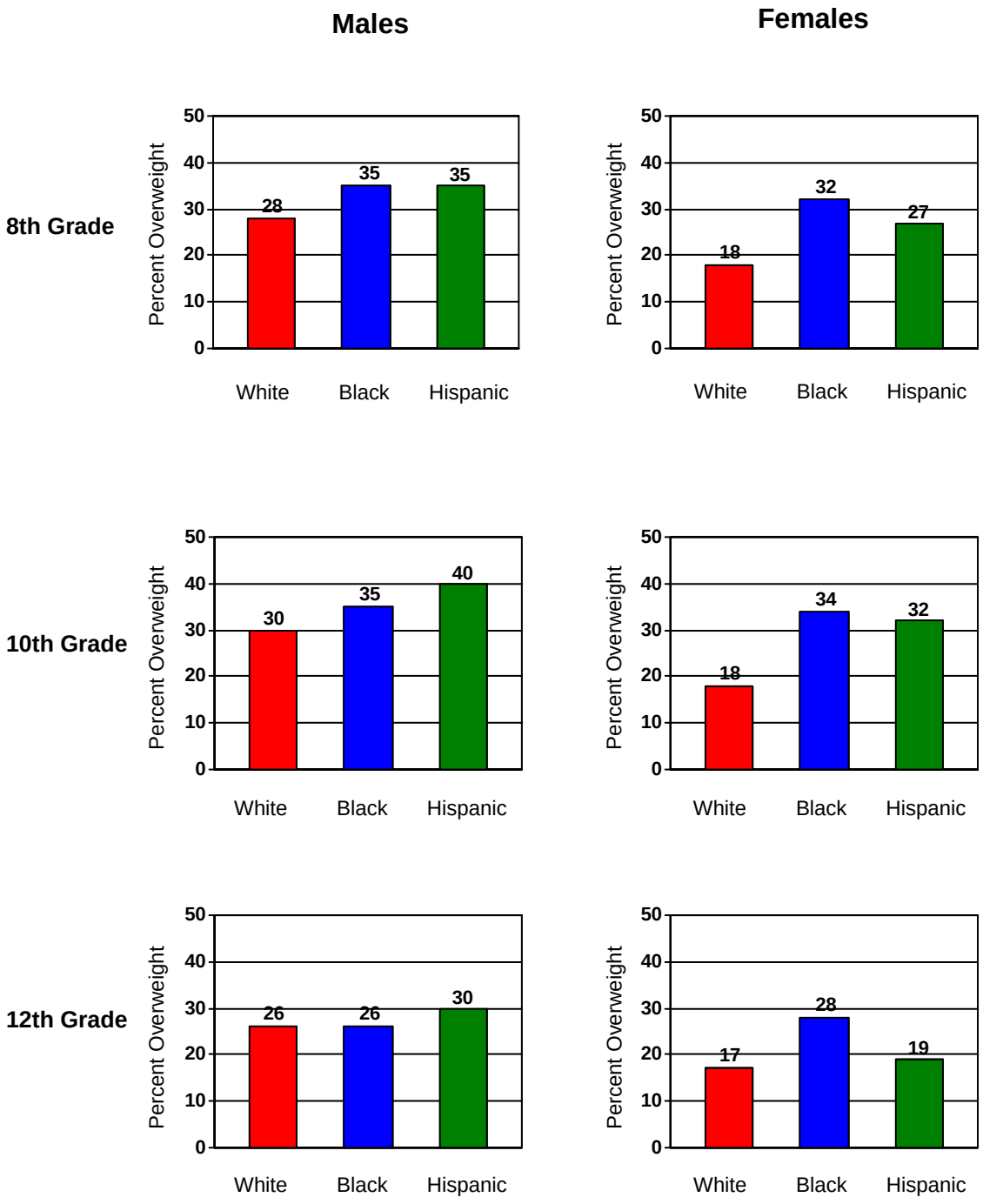
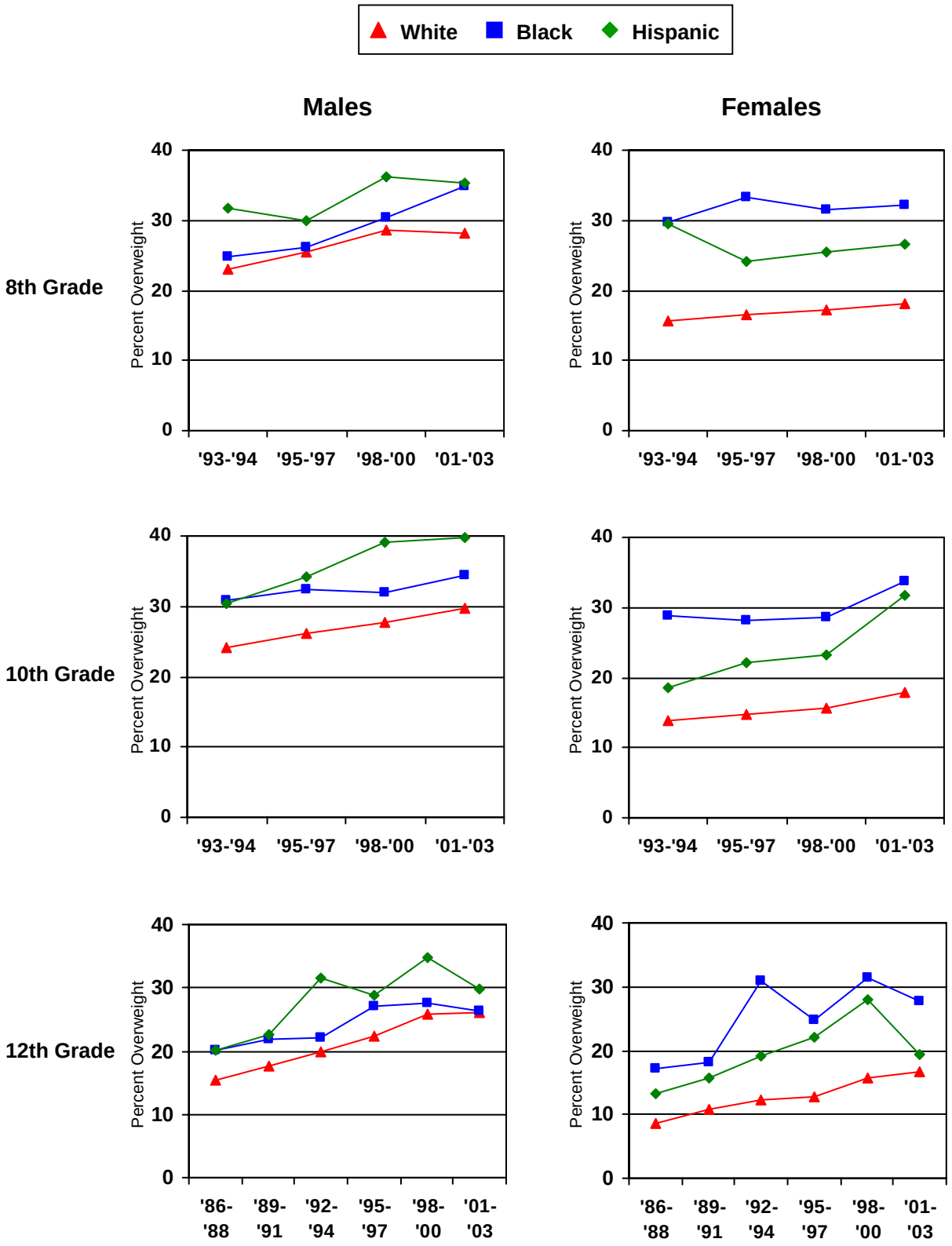


Figure 2. Percent Overweight (BMI percentile ≥ 85%): Levels and Trends by Gender, Race/Ethnicity, and Grade



Dietary Habits—Frequency of Eating Breakfast

Racial/ethnic differences. Among 8th, 10th, and 12th graders, larger percents of White males and females, compared to Black and Hispanic males and females, reported eating breakfast regularly (every day or nearly every day) across all study periods (see Tables 10, 11, and 12; see also Figure 3 for a graphic representation of the results by gender, race/ethnicity, and grade); almost all of these differences are statistically significant. (Differences between White and Hispanic 12th-grade males narrowed to non-significance in the last two three-year intervals.) Interestingly, while the percent of White and Black males who eat breakfast regularly has tended to decline over time, there has been no such decline among females.

SES differences. The lowest proportion of males and females who eat breakfast regularly is found among youth of low SES and the highest among youth of high SES across all years among 8th, 10th, and 12th graders (see Tables 10, 11, and 12). Some of these differences are quite striking: for example, in the most recent interval (2001–2003) the proportion of female youth in all three grades who eat breakfast is about twice as high in the high SES groups as in the low SES groups.

Population density and regional differences. No consistent differences in the percent of youth who eat breakfast regularly are found among 8th-, 10th-, and 12th-grade male and female students by population density or by region (see Tables 10, 11, and 12).

Table 10. Eating Breakfast Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8								
Characteristic	**1993-1994**	**Mult[a]**	**1995-1997**	**Mult[a]**	**1998-2000**	**Mult[a]**	**2001-2003**	**Mult[a]**
	% (se)		**% (se)**		**% (se)**		**% (se)**	
Total Males	57.4 (.01)		58.1 (.01)		53.5 (.01)		54.1 (.01)	
Race/Ethnicity								
White	61.2 (.01)	Ref	61.3 (.01)	Ref	56.7 (.01)	Ref	58.0 (.01)	Ref
Black	47.8 (.02)***	***	46.3 (.02)***	***	43.2 (.03)***	***	42.6 (.03)***	***
Hispanic	47.1 (.03)***	***	51.7 (.02)***	**	45.5 (.02)***	**	43.7 (.02)***	***
SES								
Low SES	49.2 (.02)	Ref	49.5 (.02)	Ref	43.3 (.02)	Ref	41.3 (.03)	Ref
Mid-SES	55.6 (.01)*		57.1 (.01)***	**	52.6 (.01)***	***	51.8 (.01)**	**
High SES	67.5 (.02)***	***	67.0 (.02)***	***	62.3 (.02)***	***	64.1 (.02)***	***
Pop. Density								
Large MSA	56.7 (.01)	Ref	54.9 (.01)	Ref	53.7 (.02)	Ref	51.9 (.02)	Ref
Other MSA	57.4 (.02)		59.4 (.01)*		53.3 (.02)		55.0 (.01)	
Non-MSA	58.1 (.02)		58.1 (.01)		53.8 (.03)		54.4 (.02)	
Region								
Northeast	58.8 (.03)	Ref	61.0 (.02)	Ref	55.4 (.02)	Ref	54.7 (.01)	Ref
North Central	57.5 (.02)		54.8 (.02)*	*	55.8 (.02)		52.3 (.02)	*
South	54.5 (.01)*		57.4 (.01)		50.2 (.02)		52.7 (.02)	
West	61.9 (.02)		61.7 (.02)		55.7 (.02)		59.3 (.03)	*
Total Females	36.6 (.01)		37.7 (.01)		37.0 (.01)		37.4 (.01)	
Race/Ethnicity								
White	40.4 (.01)	Ref	41.4 (.01)	Ref	40.9 (.01)	Ref	40.3 (.01)	Ref
Black	28.3 (.02)***	***	28.3 (.03)***	***	26.7 (.02)***	***	28.3 (.02)***	**
Hispanic	25.1 (.03)***	***	27.0 (.02)***	***	28.4 (.02)***	**	31.2 (.03)*	
SES								
Low SES	26.4 (.02)	Ref	25.8 (.02)	Ref	27.0 (.02)	Ref	24.7 (.02)	Ref
Mid-SES	34.9 (.01)***	**	35.6 (.01)***	***	35.5 (.01)***	*	35.4 (.01)***	***
High SES	49.9 (.02)***	***	53.0 (.02)***	***	48.3 (.02)***	***	51.4 (.01)***	***
Pop. Density								
Large MSA	38.1 (.02)	Ref	34.5 (.02)	Ref	38.4 (.01)	Ref	36.7 (.02)	Ref
Other MSA	35.0 (.01)		38.9 (.02)*		35.9 (.02)		38.1 (.01)	
Non-MSA	38.6 (.02)		38.1 (.01)		37.8 (.02)		37.0 (.02)	
Region								
Northeast	37.8 (.02)	Ref	40.1 (.02)	Ref	41.8 (.02)	Ref	39.7 (.02)	Ref
North Central	36.8 (.02)		35.7 (.02)		38.5 (.02)		38.2 (.02)	
South	33.7 (.02)		37.2 (.02)		33.3 (.02)***	*	33.9 (.01)*	
West	41.0 (.02)	**	39.5 (.03)		38.6 (.03)		41.2 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 11. Eating Breakfast Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	49.8 (.01)		49.2 (.01)		44.6 (.01)		42.9 (.01)	
Race/Ethnicity								
White	52.5 (.01)	Ref	51.4 (.01)	Ref	46.7 (.01)	Ref	45.5 (.01)	Ref
Black	38.7 (.03)***	*	38.3 (.02)***	***	36.9 (.02)***	***	33.4 (.02)***	***
Hispanic	36.2 (.03)***	***	41.0 (.02)***	**	38.4 (.02)***	*	37.7 (.02)***	
SES								
Low SES	40.2 (.02)	Ref	35.1 (.02)	Ref	36.2 (.02)	Ref	33.5 (.02)	Ref
Mid-SES	49.5 (.01)***	*	48.0 (.01)***	***	44.1 (.01)**	**	41.1 (.01)**	**
High SES	57.7 (.02)***	***	59.8 (.01)***	***	53.0 (.02)***	***	53.4 (.02)***	***
Pop. Density								
Large MSA	47.4 (.02)	Ref	49.2 (.02)	Ref	44.2 (.01)	Ref	39.8 (.02)	Ref
Other MSA	51.1 (.02)		48.8 (.01)		44.5 (.01)		44.2 (.01)	
Non-MSA	48.7 (.02)		50.0 (.02)		45.1 (.02)		44.2 (.01)	*
Region								
Northeast	51.7 (.01)	Ref	53.1 (.01)	Ref	47.8 (.02)	Ref	47.4 (.03)	Ref
North Central	54.4 (.02)		47.7 (.02)*	*	39.6 (.01)***	***	41.7 (.02)	*
South	44.7 (.02)***		47.3 (.01)**		45.0 (.01)		42.8 (.01)	
West	49.1 (.02)		51.4 (.02)		48.0 (.02)	*	40.7 (.02)*	
Total Females	33.6 (.01)		32.1 (.01)		31.4 (.01)		32.0 (.01)	
Race/Ethnicity								
White	36.0 (.01)	Ref	34.6 (.01)	Ref	34.0 (.01)	Ref	34.8 (.01)	Ref
Black	22.2 (.02)***	***	20.5 (.02)***	***	19.5 (.02)***	***	21.4 (.01)***	***
Hispanic	27.6 (.02)**		24.8 (.02)***	*	28.1 (.01)***		28.5 (.02)**	
SES								
Low SES	23.4 (.01)	Ref	21.3 (.02)	Ref	22.4 (.01)	Ref	22.6 (.02)	Ref
Mid-SES	32.8 (.01)***	***	31.1 (.01)***	***	29.5 (.01)***	***	30.3 (.01)***	***
High SES	46.1 (.01)***	***	44.2 (.02)***	***	44.5 (.02)***	***	44.1 (.02)***	***
Pop. Density								
Large MSA	33.0 (.02)	Ref	34.0 (.02)	Ref	32.5 (.02)	Ref	33.1 (.01)	Ref
Other MSA	33.7 (.01)		31.7 (.01)		31.2 (.01)		32.0 (.01)	
Non-MSA	33.7 (.01)		31.7 (.01)		30.5 (.02)		31.0 (.01)	
Region								
Northeast	35.9 (.01)	Ref	38.1 (.02)	Ref	34.2 (.02)	Ref	34.8 (.02)	Ref
North Central	35.4 (.02)		32.3 (.02)*		30.8 (.02)		30.1 (.01)*	*
South	30.5 (.01)**		28.8 (.01)***	*	28.7 (.01)*		31.9 (.02)	
West	33.9 (.01)		33.0 (.02)*		34.6 (.02)	*	32.5 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

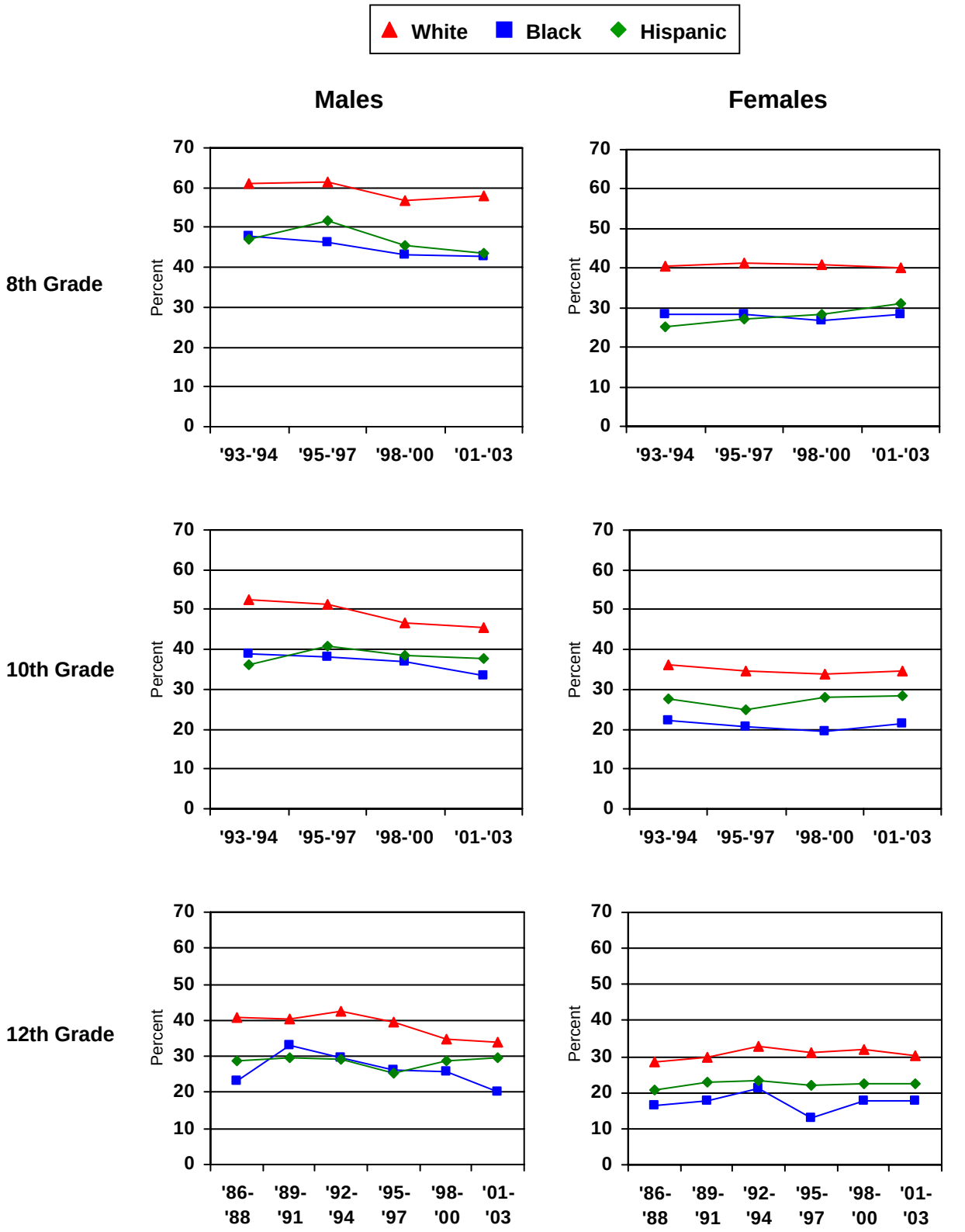
*p < 0.05. **p < 0.01. ***p < 0.001.

Table 12. Eating Breakfast Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Characteristic	Grade 12											
	1986-1988	Mult[a]	1989-1991	Mult[a]	1992-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)		% (se)		% (se)	
Total Males	38.6 (.01)		38.8 (.01)		40.1 (.01)		36.7 (.01)		33.1 (.01)		31.9 (.01)	
Race/Ethnicity												
White	40.9 (.01)	Ref	40.3 (.01)	Ref	42.7 (.01)	Ref	39.4 (.01)	Ref	34.6 (.02)	Ref	33.8 (.01)	Ref
Black	23.4 (.03)***	***	33.1 (.03)		29.8 (.04)**	**	26.4 (.03)**	**	25.7 (.03)**	*	20.3 (.03)**	*
Hispanic	28.7 (.04)**	*	29.7 (.03)**	*	29.3 (.04)**	**	25.4 (.04)**	*	28.9 (.04)		29.8 (.03)	
SES												
Low SES	32.5 (.02)	Ref	34.4 (.02)	Ref	31.3 (.03)	Ref	27.7 (.03)	Ref	27.3 (.04)	Ref	23.7 (.03)	Ref
Mid-SES	38.4 (.01)*		39.1 (.01)		40.4 (.01)**	*	35.7 (.01)*		31.4 (.02)		30.1 (.02)	
High SES	45.4 (.02)***	**	43.5 (.02)**	*	46.1 (.03)**	**	44.4 (.02)***	**	41.0 (.03)**	*	42.1 (.02)***	***
Pop. Density												
Large MSA	37.3 (.02)	Ref	39.5 (.02)	Ref	40.0 (.02)	Ref	34.9 (.02)	Ref	35.1 (.03)	Ref	31.4 (.02)	Ref
Other MSA	37.5 (.01)		38.7 (.01)		38.7 (.02)		36.2 (.02)		33.5 (.02)		32.1 (.02)	
Non-MSA	41.5 (.02)		38.2 (.02)		42.6 (.02)		39.1 (.03)		30.7 (.03)		32.1 (.02)	
Region												
Northeast	40.2 (.03)	Ref	40.0 (.03)	Ref	38.0 (.03)	Ref	38.8 (.02)	Ref	31.6 (.02)	Ref	30.1 (.02)	Ref
North Central	37.5 (.02)		36.0 (.02)		39.1 (.02)		33.2 (.02)		32.9 (.03)		32.6 (.02)	
South	37.2 (.02)		39.0 (.02)		42.1 (.02)		38.4 (.02)		32.5 (.02)		30.3 (.02)	
West	41.2 (.02)		41.5 (.02)		39.4 (.02)		37.2 (.03)		35.7 (.02)		35.6 (.02)	*
Total Females	26.7 (.01)		27.9 (.01)		30.3 (.01)		28.0 (.01)		29.1 (.01)		27.7 (.01)	
Race/Ethnicity												
White	28.4 (.01)	Ref	30.0 (.01)	Ref	32.7 (.01)	Ref	30.9 (.01)	Ref	32.0 (.01)	Ref	30.4 (.01)	Ref
Black	16.6 (.02)***	***	17.8 (.03)**	***	21.3 (.05)*		13.0 (.02)***	***	17.6 (.02)***	**	17.8 (.02)***	***
Hispanic	20.8 (.03)**		22.7 (.03)*		23.4 (.02)***		22.2 (.03)**		22.6 (.03)*		22.3 (.03)*	*
SES												
Low SES	20.9 (.01)	Ref	19.4 (.02)	Ref	22.8 (.04)	Ref	18.6 (.02)	Ref	22.6 (.03)	Ref	20.3 (.03)	Ref
Mid-SES	26.1 (.01)**	*	29.2 (.01)***	***	29.7 (.01)		26.9 (.01)**	**	27.4 (.01)		26.4 (.01)	
High SES	36.5 (.02)***	***	33.7 (.02)***	***	40.9 (.02)***	***	37.8 (.02)***	***	40.2 (.03)***	**	37.8 (.03)***	**
Pop. Density												
Large MSA	27.2 (.02)	Ref	28.3 (.02)	Ref	29.9 (.02)	Ref	28.6 (.01)	Ref	24.6 (.02)	Ref	28.3 (.02)	Ref
Other MSA	25.9 (.01)		26.5 (.02)		27.8 (.01)		27.1 (.02)		30.2 (.02)*	*	28.3 (.01)	
Non-MSA	27.8 (.02)		30.4 (.01)		34.6 (.03)		28.8 (.02)		31.7 (.02)*	**	26.1 (.02)	
Region												
Northeast	25.0 (.02)	Ref	28.5 (.03)	Ref	32.5 (.03)	Ref	32.1 (.02)	Ref	32.1 (.02)	Ref	30.3 (.03)	Ref
North Central	26.8 (.01)		27.6 (.02)		30.8 (.02)		24.8 (.02)*	*	30.5 (.03)		27.2 (.02)	
South	29.0 (.02)	*	28.2 (.02)		28.9 (.02)		29.0 (.02)		25.9 (.02)*		26.1 (.02)	
West	24.0 (.02)		27.1 (.03)		30.7 (.02)		26.8 (.02)		30.8 (.03)		29.7 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 3. Eating Breakfast Regularly (Nearly Every Day or Every Day): Levels and Trends by Gender, Race/Ethnicity, and Grade



Dietary Habits—Frequency of Eating Fruit

Racial/ethnic differences. Across all three grades and both genders, Whites have consistently reported the highest rate of fruit consumption. For a graphic representation of these results by gender, race/ethnicity, and grade, see Figure 4. The percent of males in 8th grade who eat fruit regularly (nearly every day or every day) has not differed much according to their racial/ethnic background until very recently, with Black and Hispanic youth less likely than White youth to eat fruit regularly (see Table 13). On the other hand, the percent of Black and Hispanic females in 8th grade who eat fruit regularly has consistently been quite a bit lower than the percent of White females who do.

The lowest proportion of males and females in 10th grade who eat fruit regularly is found among Black youth, followed by Hispanic youth (see Table 14). Among 12th graders, the lowest proportion of youth who eat fruit regularly is generally found among Black males and females (with exceptions in 1992–1997, when Hispanic males were lowest), though these differences are no longer statistically significant in the most recent years (2001–2003; see Table 15).

SES differences. There is an ordinal relationship between the percent of youth who eat fruit and SES level among 8th- and 10th-grade males and females (see Tables 13–14). One interesting finding is that the magnitude of the difference between high- and mid-SES youth is larger than that of mid- and low-SES youth among 8th and 10th graders. Also, the proportion of 10th-grade males and females of low SES who eat fruit regularly is no longer different from that of mid-SES males and females in the most recent period (2001–2003). In 12th grade, there are greater proportions of high-SES males and females who eat fruit regularly than low- and mid-SES youth across all the time periods (see Table 15).

Population density and regional differences. There are few consistent differences by population density or by region in the percent of youth who eat fruit regularly among 8th- and 10th-grade males and females (see Tables 13 and 14); exceptions are the lower frequency of fruit consumption found among 10th-grade females living in the South in the most recent years (2001–2003; see Table 14). Among 12th graders, the lowest consumption of fruits tends to be among males and females living in the South, though these differences are not statistically significant in the most recent years (see Table 15).

Table 13. Eating Fruit Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	54.3 (.01)		55.1 (.01)		52.2 (.01)		51.5 (.01)	
Race/Ethnicity								
White	55.4 (.01)	Ref	55.6 (.01)	Ref	52.9 (.01)	Ref	54.1 (.01)	Ref
Black	52.1 (.02)		53.0 (.02)		49.5 (.02)		42.6 (.03)***	**
Hispanic	50.6 (.03)		54.5 (.03)		50.8 (.03)		46.3 (.03)**	*
SES								
Low SES	44.2 (.02)	Ref	50.1 (.02)	Ref	44.6 (.02)	Ref	40.0 (.03)	Ref
Mid-SES	52.3 (.01)***	**	53.1 (.01)		50.9 (.02)*	*	49.1 (.01)**	**
High SES	66.0 (.01)***	***	64.8 (.02)***	***	61.3 (.02)***	***	63.9 (.02)***	***
Pop. Density								
Large MSA	56.7 (.02)	Ref	55.7 (.01)	Ref	52.3 (.01)	Ref	51.0 (.02)	Ref
Other MSA	54.9 (.01)		56.0 (.01)		53.8 (.02)		53.0 (.01)	
Non-MSA	51.2 (.03)		53.2 (.02)		49.2 (.03)		50.0 (.02)	
Region								
Northeast	55.0 (.01)	Ref	57.1 (.02)	Ref	56.5 (.02)	Ref	52.4 (.02)	Ref
North Central	54.5 (.02)		53.1 (.01)		50.5 (.02)*		49.5 (.02)	
South	51.1 (.02)		53.3 (.02)		48.6 (.02)**		49.7 (.02)	
West	59.8 (.02)*	***	59.9 (.02)		57.9 (.02)		58.3 (.01)	**
Total Females	53.8 (.01)		53.7 (.01)		51.4 (.01)		50.0 (.01)	
Race/Ethnicity								
White	56.8 (.01)	Ref	56.7 (.01)	Ref	54.0 (.01)	Ref	51.7 (.01)	Ref
Black	46.9 (.02)***	*	43.3 (.03)***	***	44.7 (.02)***		44.6 (.02)**	
Hispanic	44.6 (.02)***	**	48.7 (.02)**	*	44.9 (.02)***		46.0 (.02)*	
SES								
Low SES	42.1 (.02)	Ref	43.4 (.02)	Ref	39.0 (.02)	Ref	38.8 (.02)	Ref
Mid-SES	52.4 (.01)***	***	51.2 (.01)***	***	50.2 (.01)***	***	47.9 (.01)***	***
High SES	68.9 (.02)***	***	69.4 (.02)***	***	64.9 (.02)***	***	63.7 (/02)***	***
Pop. Density								
Large MSA	57.6 (.02)	Ref	52.6 (.02)	Ref	50.9 (.02)	Ref	50.5 (.02)	Ref
Other MSA	53.9 (.01)		54.7 (.02)		53.1 (.02)		50.3 (.02)	
Non-MSA	50.4 (.02)*		52.8 (.02)		48.7 (.02)		49.0 (.02)	
Region								
Northeast	56.3 (.03)	Ref	53.4 (.03)	Ref	54.8 (.02)	Ref	49.7 (.03)	Ref
North Central	55.2 (.02)		51.5 (.02)		52.1 (.02)		50.6 (.02)	
South	48.9 (.02)**		52.0 (.01)		46.6 (.01)***	*	47.4 (.02)	
West	59.2 (.02)	*	60.7 (.02)*	***	57.4 (.03)		54.7 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 14. Eating Fruit Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	47.2 (.01)		47.2 (.01)		43.2 (.01)		41.4 (.01)	
Race/Ethnicity								
White	48.7 (.01)	Ref	48.2 (.01)	Ref	44.7 (.01)	Ref	42.7 (.01)	Ref
Black	41.7 (.02)*		42.0 (.02)**		38.1 (.02)**		35.3 (.02)*	*
Hispanic	38.8 (.03)**	*	43.4 (.02)*		38.7 (.03)*		40.5 (.02)	
SES								
Low SES	38.1 (.02)	Ref	33.6 (.02)	Ref	34.1 (.02)	Ref	36.0 (.02)	Ref
Mid-SES	45.7 (.01)**	*	46.8 (.01)***	***	40.6 (.01)***	***	38.8 (.01)	
High SES	57.3 (.02)***	***	55.8 (.01)***	***	55.8 (.02)***	***	51.4 (.02)***	***
Pop. Density								
Large MSA	46.3 (.02)	Ref	49.4 (.02)	Ref	43.1 (.02)	Ref	41.3 (.01)	Ref
Other MSA	49.4 (.01)		46.6 (.01)		44.3 (.02)		42.8 (.01)	
Non-MSA	43.7 (.02)		46.9 (.02)		41.4 (.02)		38.7 (.02)	
Region								
Northeast	50.8 (.01)	Ref	49.5 (.02)	Ref	46.2 (.02)	Ref	44.3 (.02)	Ref
North Central	47.9 (.02)		46.1 (.02)		40.2 (.02)*	*	41.2 (.02)	
South	43.5 (.02)***		45.0 (.01)*		40.6 (.02)*		39.6 (.01)	
West	49.4 (.02)		51.6 (.02)		49.2 (.02)	**	42.5 (.02)	
Total Females	45.6 (.01)		46.6 (.01)		43.5 (.01)		42.1 (.01)	
Race/Ethnicity								
White	47.7 (.01)	Ref	48.0 (.01)	Ref	45.4 (.01)	Ref	44.3 (.01)	Ref
Black	36.4 (.02)***	***	38.7 (.02)***		36.5 (.03)**	*	34.9 (.02)***	*
Hispanic	40.7 (.03)*		44.1 (.02)		39.2 (.02)*	*	37.8 (.02)**	
SES								
Low SES	34.6 (.02)	Ref	35.2 (.02)	Ref	35.8 (.02)	Ref	35.9 (.02)	Ref
Mid-SES	44.0 (.01)***	***	45.2 (.01)***	***	41.2 (.01)*		38.2 (.01)	
High SES	62.6 (.01)***	***	60.2 (.01)***	***	56.6 (.02)***	***	57.0 (.02)***	***
Pop. Density								
Large MSA	49.9 (.02)	Ref	50.8 (.02)	Ref	47.1 (.02)	Ref	43.8 (.02)	Ref
Other MSA	46.8 (.01)		46.8 (.02)		44.0 (.02)		42.2 (.01)	
Non-MSA	41.0 (.02)**	**	43.3 (.02)**		38.9 (.01)***	**	40.0 (.02)	
Region								
Northeast	53.6 (.02)	Ref	56.0 (.01)	Ref	47.9 (.02)	Ref	47.1 (.02)	Ref
North Central	45.2 (.02)**	***	46.6 (.02)***	***	43.2 (.02)		42.4 (.01)	
South	40.9 (.01)***	**	40.2 (.01)***	***	38.9 (.01)***		38.4 (.02)**	*
West	48.7 (.02)		51.3 (.03)		48.6 (.02)	*	44.5 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

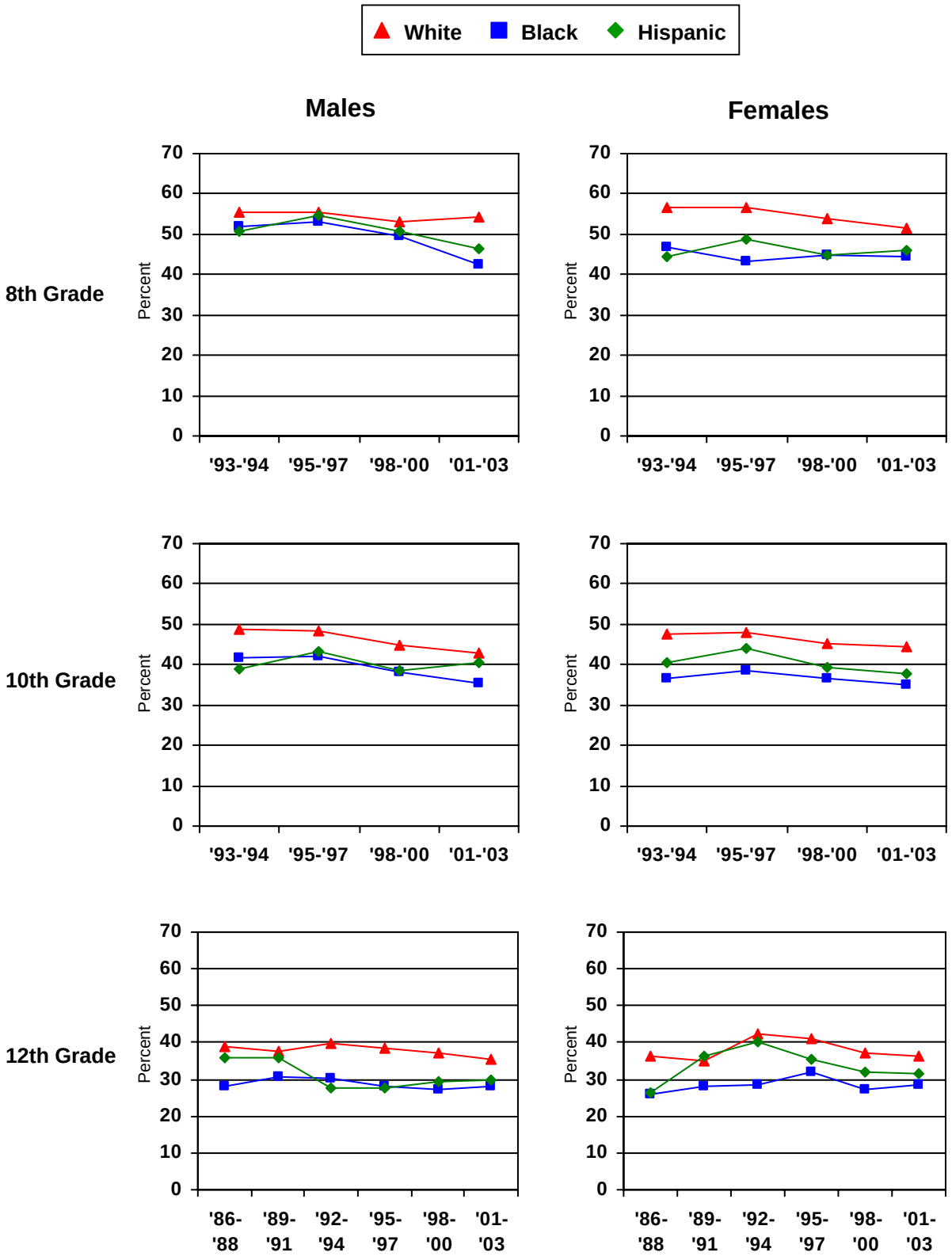
Table 15. Eating Fruit Regularly (Nearly Every Day, or Every day): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Grade 12

Characteristic	1986-1988 % (se)	Mult[a]	1989-1991 % (se)	Mult[a]	1992-1994 % (se)	Mult[a]	1995-1997 % (se)	Mult[a]	1998-2000 % (se)	Mult[a]	2001-2003 % (se)	Mult[a]
Total Males	37.6 (.01)		36.9 (.01)		37.8 (.01)		36.5 (.01)		35.4 (.01)		34.2 (.01)	
Race/Ethnicity												
White	38.7 (.01)	Ref	37.7 (.01)	Ref	39.9 (.01)	Ref	38.6 (.02)	Ref	37.2 (.01)	Ref	35.6 (.01)	Ref
Black	28.0 (.02)***	**	30.5 (.03)		30.3 (.03)**	*	28.3 (.03)**	*	27.1 (.03)**	*	28.2 (.04)	
Hispanic	35.8 (.04)		35.9 (.03)		27.7 (.05)*		27.8 (.03)**		29.5 (.04)		30.0 (.03)	
SES												
Low SES	32.5 (.02)	Ref	31.5 (.02)	Ref	25.0 (.03)	Ref	27.1 (.03)	Ref	30.6 (.03)	Ref	22.3 (.03)	Ref
Mid-SES	36.9 (.01)		35.0 (.02)		38.1 (.01)***	**	35.3 (.02)**	*	33.2 (.02)		31.8 (.01)**	*
High SES	45.3 (.03)***	**	47.7 (.02)**	***	47.2 (.03)***	***	44.3 (.03)***	***	44.2 (.03)**	**	48.1 (.02)***	***
Pop. Density												
Large MSA	39.7 (.02)	Ref	34.7 (.02)	Ref	36.9 (.02)	Ref	36.2 (.02)	Ref	37.5 (.02)	Ref	35.7 (.03)	Ref
Other MSA	36.6 (.02)		39.3 (.02)		38.7 (.02)		37.1 (.02)		36.0 (.02)		35.0 (.01)	
Non-MSA	37.3 (.03)		34.5 (.02)		36.7 (.03)		35.9 (.03)		32.8 (.02)		31.3 (.02)	
Region												
Northeast	44.2 (.02)	Ref	33.4 (.03)	Ref	41.5 (.02)	Ref	40.9 (.02)	Ref	32.2 (.03)	Ref	33.0 (.02)	Ref
North Central	36.2 (.02)**	**	38.6 (.03)		39.0 (.02)		38.7 (.03)		37.7 (.02)		36.6 (.02)	
South	31.6 (.02)***	***	36.1 (.02)		35.3 (.02)*		32.5 (.02)**	*	33.4 (.02)		31.0 (.02)	
West	43.6 (.03)		39.4 (.02)		38.1 (.02)		36.9 (.03)		38.6 (.04)		37.7 (.03)	
Total Females	34.6 (.01)		34.5 (.01)		40.3 (.01)		39.4 (.01)		35.2 (.01)		34.8 (.01)	
Race/Ethnicity												
White	36.3 (.01)	Ref	35.2 (.01)	Ref	42.2 (.01)	Ref	41.1 (.01)	Ref	37.1 (.02)	Ref	36.5 (.01)	Ref
Black	26.1 (.02)***	*	28.3 (.02)*		28.6 (.02)***	**	32.1 (.03)**		27.2 (.03)**		28.7 (.03)*	
Hispanic	26.5 (.03)**		36.4 (.04)		40.0 (.04)		35.3 (.04)		32.0 (.03)		31.5 (.04)	
SES												
Low SES	25.5 (.02)	Ref	27.7 (.03)	Ref	37.0 (.03)	Ref	27.1 (.02)	Ref	26.9 (.03)	Ref	28.3 (.03)	Ref
Mid-SES	33.3 (.01)**	**	34.3 (.01)*	**	38.1 (.01)		39.6 (.02)***	***	34.5 (.02)*		34.4 (.02)	
High SES	51.6 (.02)***	***	45.6 (.03)***	***	52.8 (.02)***	***	48.5 (.02)***	***	45.6 (.03)***	***	41.4 (.02)**	**
Pop. Density												
Large MSA	36.8 (.02)	Ref	32.8 (.02)	Ref	42.5 (.02)	Ref	41.9 (.02)	Ref	36.5 (.03)	Ref	37.4 (.02)	Ref
Other MSA	34.7 (.02)		35.4 (.02)		38.1 (.02)		37.0 (.02)		36.2 (.02)		34.1 (.02)	
Non-MSA	32.7 (.02)		34.1 (.02)		41.9 (.02)		41.2 (.03)		32.2 (.03)		33.2 (.02)	
Region												
Northeast	41.6 (.02)	Ref	37.6 (.03)	Ref	44.5 (.02)	Ref	42.4 (.03)	Ref	39.4 (.03)	Ref	37.9 (.03)	Ref
North Central	34.3 (.02)**	**	33.7 (.03)		41.8 (.02)		39.8 (.02)		36.1 (.03)		33.6 (.02)	
South	29.2 (.02)***	**	31.4 (.01)*		35.2 (.02)**	*	36.6 (.02)		30.2 (.02)*		32.1 (.02)	
West	37.7 (.03)		38.6 (.02)		44.7 (.03)		42.0 (.03)		40.3 (.03)		39.8 (.03)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 4. Eating Fruit Regularly (Nearly Every Day or Every Day): Levels and Trends by Gender, Race/Ethnicity, and Grade



Dietary Habits—Frequency of Eating Vegetables

Racial/ethnic differences. Hispanic and Black males and females in 8th, 10th, and 12th grades are less likely to eat vegetables regularly (nearly every day or every day) than White youth across all years (see Tables 16, 17, and 18; see also Figure 5 for a graphic representation of these results by gender, race/ethnicity, and grade). Hispanic youth tend to be lowest in the proportion of youth who eat vegetables regularly among 8th and 10th graders, with no consistent difference in 12th grade between Black and Hispanic youth.

SES differences. There is an ordinal relationship between the percent of youth who eat vegetables and SES level among 8th-, 10th-, and 12th-grade males and females (see Tables 16, 17, and 18) across all years. Interestingly, the magnitude of the difference between high- and mid-SES youth is either equal or larger than that of mid- and low-SES youth in 8th, 10th, and 12th grades.

Population density and regional differences. No significant differences in the proportion of youth who eat vegetables regularly by population density is observed among 8th-, 10th-, and 12th-grade students (see Tables 16, 17, and 18). A few differences in the proportion of youth who eat vegetables exist among regions. Specifically, a lower proportion of males in 8th grade from the North Central and Southern regions eat vegetables regularly when compared to youth living in the Northeast (see Table 16). Among 10th graders, males and females who live in the North Central and Southern regions are less likely to eat vegetables regularly than youth who live in the Northeast (see Table 17).

Among 12th-grade males, differences observed in the 1986–1988 period in the proportion of youth who eat vegetables by region no longer exist in the most recent years as a result of a substantial decline in the percent of youth from the Northeast who report eating vegetables regularly (see Table 18). Among females, there are no current differences as a function of region or population density.

Table 16. Eating Vegetables Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8								
Characteristic	**1993-1994**	**Mult[a]**	**1995-1997**	**Mult[a]**	**1998-2000**	**Mult[a]**	**2001-2003**	**Mult[a]**
	% (se)		**% (se)**		**% (se)**		**% (se)**	
Total Males	42.4 (.01)		44.2 (.01)		42.8 (.01)		44.3 (.01)	
Race/Ethnicity								
White	47.1 (.01)	Ref	47.9 (.01)	Ref	46.0 (.01)	Ref	49.2 (.01)	Ref
Black	31.2 (.02)***	***	33.7 (.03)***	***	35.8 (.02)***	***	31.3 (.03)***	***
Hispanic	27.9 (.02)***	***	33.1 (.02)***	***	30.9 (.02)***	***	30.7 (.02)***	***
SES								
Low SES	28.7 (.03)	Ref	34.9 (.02)	Ref	34.0 (.02)	Ref	31.3 (.03)	Ref
Mid-SES	41.9 (.01)***	**	43.3 (.01)***	**	41.8 (.01)**	**	43.4 (.01)***	***
High SES	54.0 (.02)***	***	54.4 (.02)***	***	52.2 (.02)***	***	55.2 (.02)***	***
Pop. Density								
Large MSA	45.2 (.02)	Ref	41.0 (.02)	Ref	44.1 (.02)	Ref	42.4 (.03)	Ref
Other MSA	42.5 (.01)		45.6 (.02)		42.2 (.02)		45.3 (.02)	
Non-MSA	39.7 (.03)		44.0 (.02)		42.9 (.03)		44.4 (.02)	
Region								
Northeast	47.8 (.02)	Ref	46.7 (.03)	Ref	49.6 (.02)	Ref	48.3 (.02)	Ref
North Central	42.6 (.02)		39.8 (.01)*	**	41.0 (.02)***	***	42.7 (.02)	*
South	37.8 (.02)***		43.6 (.02)		39.7 (.02)***	**	43.3 (.02)	
West	46.2 (.02)		49.6 (.02)	*	45.7 (.03)		45.5 (.02)	
Total Females	42.2 (.01)		42.0 (.01)		40.9 (.01)		39.0 (.01)	
Race/Ethnicity								
White	48.4 (.01)	Ref	47.7 (.01)	Ref	46.6 (.01)	Ref	43.5 (.01)	Ref
Black	29.6 (.02)***	***	27.5 (.02)***	***	28.5 (.02)***	***	28.5 (.02)***	***
Hispanic	21.6 (.02)***	***	24.8 (.02)***	***	23.8 (.02)***	***	24.9 (.02)***	***
SES								
Low SES	28.5 (.02)	Ref	29.4 (.02)	Ref	25.0 (.02)	Ref	23.0 (.02)	Ref
Mid-SES	40.9 (.01)***	***	40.4 (.01)***	***	40.9 (.01)***	***	38.0 (.01)***	***
High SES	59.1 (.02)***	***	58.3 (.02)***	***	54.7 (.02)***	***	53.7 (.02)***	***
Pop. Density								
Large MSA	45.6 (.03)	Ref	41.6 (.02)	Ref	42.0 (.02)	Ref	38.1 (.02)	Ref
Other MSA	41.9 (.02)		42.9 (.02)		41.7 (.02)		40.0 (.02)	
Non-MSA	40.0 (.02)		40.7 (.02)		38.3 (.02)		38.3 (.02)	
Region								
Northeast	49.1 (.02)	Ref	46.8 (.03)	Ref	44.4 (.02)	Ref	43.4 (.02)	Ref
North Central	41.6 (.02)**		39.5 (.01)*	**	39.1 (.02)		38.8 (.02)	
South	37.9 (.02)***		39.6 (.02)		38.2 (.02)*		36.0 (.02)*	
West	45.1 (.03)		46.8 (.02)		46.0 (.03)*	*	41.4 (.03)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 17. Eating Vegetables Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	41.8 (.01)		42.7 (.01)		38.4 (.01)		36.6 (.01)	
Race/Ethnicity								
White	44.6 (.01)	Ref	44.7 (.01)	Ref	41.9 (.01)	Ref	39.9 (.01)	Ref
Black	33.9 (.02)***	***	33.6 (.02)***	***	28.3 (.03)***	**	27.3 (.02)***	***
Hispanic	25.5 (.02)***	***	34.0 (.02)***	*	25.4 (.02)***	***	26.3 (.02)***	***
SES								
Low SES	29.7 (.02)	Ref	27.6 (.02)	Ref	25.2 (.02)	Ref	26.3 (.02)	Ref
Mid-SES	40.3 (.01)***	**	41.3 (.01)***	***	37.3 (.01)***	***	34.6 (.01)***	*
High SES	54.2 (.02)***	***	54.3 (.01)***	***	49.6 (.02)***	***	47.2 (.02)***	***
Pop. Density								
Large MSA	40.3 (.02)	Ref	42.3 (.02)	Ref	37.1 (.02)	Ref	36.2 (.02)	Ref
Other MSA	42.7 (.01)		43.3 (.01)		39.2 (.02)		38.1 (.01)	
Non-MSA	41.1 (.02)		41.7 (.02)		38.1 (.02)		33.8 (.02)	
Region								
Northeast	44.0 (.01)	Ref	46.9 (.02)	Ref	42.8 (.01)	Ref	43.4 (.02)	Ref
North Central	43.6 (.02)		38.9 (.01)***	***	34.9 (.02)***	***	35.4 (.01)**	**
South	38.3 (.01)**		41.6 (.01)**		37.5 (.02)*		36.5 (.01)*	
West	43.0 (.03)		46.7 (.03)		40.6 (.03)		31.7 (.02)***	*
Total Females	39.8 (.01)		40.5 (.01)		38.7 (.01)		35.8 (.01)	
Race/Ethnicity								
White	43.5 (.01)	Ref	43.5 (.01)	Ref	42.8 (.01)	Ref	39.1 (.01)	Ref
Black	25.4 (.02)***	***	27.8 (.02)***	***	28.5 (.03)***	***	28.9 (.02)***	**
Hispanic	26.4 (.02)***	***	30.3 (.03)***	***	24.9 (.02)***	***	24.7 (.01)***	***
SES								
Low SES	27.4 (.02)	Ref	27.9 (.02)	Ref	26.2 (.02)	Ref	24.6 (.01)	Ref
Mid-SES	38.6 (.01)***	***	40.0 (.01)***	***	37.5 (.01)***	***	33.9 (.01)***	***
High SES	56.1 (.02)***	***	53.2 (.01)***	***	53.3 (.02)***	***	49.6 (.02)***	***
Pop. Density								
Large MSA	41.8 (.02)	Ref	41.9 (.01)	Ref	39.4 (.02)	Ref	35.8 (.02)	Ref
Other MSA	40.4 (.01)		41.1 (.02)		38.6 (.02)		36.9 (.01)	
Non-MSA	39.8 (.01)		38.5 (.02)		38.1 (.02)		33.5 (.01)	
Region								
Northeast	50.7 (.02)	Ref	49.8 (.02)	Ref	44.3 (.02)	Ref	42.4 (.02)	Ref
North Central	37.8 (.01)***	***	37.8 (.01)***	***	37.2 (.01)**	**	35.1 (.01)***	***
South	35.9 (.01)***	*	37.3 (.01)***	***	36.4 (.01)**		32.8 (.01)***	***
West	40.4 (.02)**		42.5 (.03)		39.5 (.03)		36.6 (.02)**	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

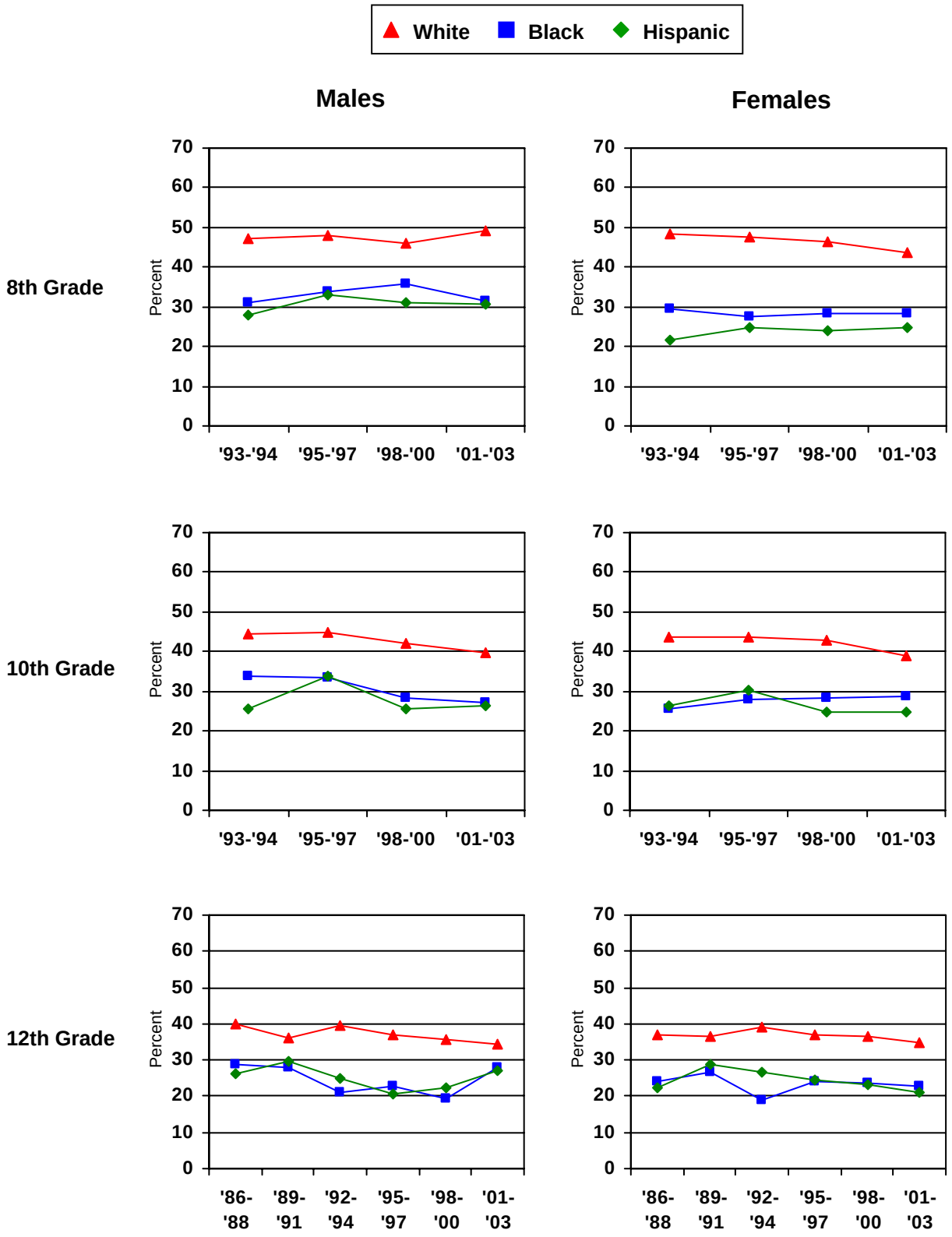
*p < 0.05. **p < 0.01. ***p < 0.001.

Table 18. Eating Vegetables Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Characteristic	Grade 12											
	1986-1988	Mult[a]	1989-1991	Mult[a]	1992-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	38.0 (.01)		34.8 (.01)		36.2 (.01)		33.9 (.01)		32.5 (.01)		32.8 (.01)	
Race/Ethnicity												
White	39.9 (.01)	Ref	36.0 (.01)	Ref	39.6 (.01)	Ref	36.8 (.01)	Ref	35.5 (.01)	Ref	34.2 (.01)	Ref
Black	28.6 (.03)***	**	27.7 (.03)*	**	20.9 (.03)***	***	22.6 (.02)***	***	19.5 (.03)***	***	28.1 (.03)	
Hispanic	26.1 (.04)**	*	29.6 (.03)		25.1 (.05)*	*	20.6 (.03)***	***	22.2 (.03)***	**	27.1 (.03)*	
SES												
Low SES	28.7 (.02)	Ref	27.7 (.02)	Ref	24.7 (.02)	Ref	18.9 (.03)	Ref	26.2 (.03)	Ref	16.8 (.03)	Ref
Mid SES	38.2 (.01)***	**	34.5 (.01)**	**	35.8 (.01)**	*	33.2 (.01)***	**	30.8 (.01)		31.4 (.01)***	***
High SES	47.6 (.02)***	***	42.7 (.02)***	***	46.8 (.03)***	***	43.3 (.02)***	***	40.7 (.03)***	*	46.0 (.02)***	***
Pop. Density												
Large MSA	38.9 (.02)	Ref	36.1 (.03)	Ref	38.6 (.02)	Ref	31.7 (.02)	Ref	32.4 (.02)	Ref	35.8 (.02)	Ref
Other MSA	37.7 (.02)		36.2 (.02)		35.6 (.02)		35.6 (.02)		33.3 (.02)		31.9 (.01)	
Non-MSA	37.7 (.02)		31.0 (.02)		35.6 (.03)		32.9 (.02)		31.4 (.02)		31.2 (.02)	
Region												
Northeast	45.8 (.02)	Ref	33.0 (.03)	Ref	41.6 (.02)	Ref	35.3 (.02)	Ref	31.9 (.02)	Ref	31.0 (.02)	Ref
North Central	33.8 (.02)***	***	33.0 (.03)		35.4 (.02)	*	32.7 (.03)		30.8 (.02)		32.2 (.02)	
South	35.4 (.02)***	***	36.4 (.02)	*	34.9 (.02)*		33.1 (.02)		33.9 (.02)		32.6 (.02)	
West	41.4 (.03)		36.3 (.02)		36.2 (.03)		35.9 (.03)		33.0 (.03)		35.6 (.03)	
Total Females	34.7 (.01)		34.9 (.01)		35.4 (.01)		34.3 (.01)		33.3 (.01)		31.4 (.01)	
Race/Ethnicity												
White	37.0 (.01)	Ref	36.6 (.02)	Ref	39.1 (.01)	Ref	37.0 (.01)	Ref	36.3 (.01)	Ref	34.7 (.01)	Ref
Black	24.1 (.03)***	***	26.6 (.03)**	**	19.1 (.03)***	***	23.9 (.02)***	**	23.8 (.03)***	*	22.7 (.03)**	**
Hispanic	22.3 (.04)**	*	28.9 (.03)*		26.6 (.03)***	**	24.6 (.03)**		23.1 (.03)***	*	21.1 (.04)**	*
SES												
Low SES	28.0 (.02)	Ref	26.9 (.02)	Ref	27.7 (.03)	Ref	19.1 (.02)	Ref	24.3 (.03)	Ref	18.6 (.03)	Ref
Mid SES	32.9 (.01)*		35.0 (.02)**	**	34.1 (.01)*		34.1 (.01)***	***	32.3 (.02)*		31.5 (.01)***	**
High SES	51.2 (.02)**	***	45.9 (.03)***	***	49.0 (.03)***	***	45.5 (.03)***	***	44.3 (.03)***	***	41.1 (.02)***	***
Pop. Density												
Large MSA	34.9 (.02)	Ref	34.8 (.02)	Ref	37.9 (.02)	Ref	34.8 (.02)	Ref	32.5 (.02)	Ref	31.6 (.02)	Ref
Other MSA	35.5 (.02)		34.6 (.02)		33.0 (.02)		31.5 (.02)		34.3 (.01)		30.5 (.01)	
Non-MSA	33.2 (.02)		35.5 (.03)		37.0 (.02)		38.3 (.02)		32.4 (.03)		32.6 (.02)	
Region												
Northeast	37.6 (.03)	Ref	38.6 (.03)	Ref	42.7 (.03)	Ref	35.9 (.02)	Ref	40.2 (.02)	Ref	32.0 (.03)	Ref
North Central	31.7 (.02)	*	30.8 (.03)		33.3 (.02)*	**	33.1 (.02)		33.2 (.02)*		31.0 (.02)	
South	35.8 (.02)		34.4 (.02)		31.7 (.02)**	*	35.0 (.02)		31.4 (.02)**		31.2 (.01)	
West	34.7 (.02)		38.6 (.02)		39.7 (.02)		32.9 (.03)		31.1 (.03)*		31.7 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 5. Eating Vegetables Regularly (Nearly Every Day or Every Day): Levels and Trends by Gender, Race/Ethnicity, and Grade



Exercise Habits

Racial/ethnic differences. At 8th grade a smaller proportion of Hispanic and Black males than White males exercised vigorously on a regular basis (nearly every day or every day) in the 1993–1994 years, but in subsequent years the differences are no longer statistically significant (see Table 19; see also Figure 6 for a graphic representation of these results by gender, race/ethnicity, and grade). Among 8th-grade females, the proportion of Hispanic and Black females who exercise vigorously on a regular basis has consistently been considerably less than the proportion of White females, across all the years. Among 10th-grade males there are no consistent differences in the proportion of youth who exercise vigorously by racial/ethnic backgrounds. Among females, Black females are less likely to exercise vigorously on a regular basis than White females across all years (see Table 20).

Among 12th graders, there have been no consistent differences in the percent of males who exercise vigorously on a regular basis by their racial/ethnic backgrounds; but Black females have consistently reported getting less vigorous exercise than White females (see Table 21).

SES differences. The proportion of both males and females in 8th, 10th, and 12th grades who exercise vigorously on a regular basis is significantly higher in the mid- and high-SES strata than in the low-SES stratum (see Tables 19, 20, and 21). For females, in particular, these social class differences are quite large.

Population density and regional differences. There are no consistent differences or patterns by population density in the proportion of youth who exercise vigorously on a regular basis (see Tables 19, 20, and 21). There is a tendency for females in the South to be lowest in frequency of vigorous exercise, but this association is rarely significant in the multivariate context.

Table 19. Frequent Vigorous Exercise (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	60.8 (.01)		60.4 (.01)		60.5 (.01)		60.1 (.01)	
Race/Ethnicity								
White	63.0 (.01)	Ref	60.8 (.01)	Ref	61.2 (.01)	Ref	61.2 (.01)	Ref
Black	53.9 (.02)***	***	60.3 (.03)		58.6 (.03)		58.1 (.03)	
Hispanic	56.1 (.03)*		57.8 (0.2)		58.2 (.02)		56.3 (.02)*	
SES								
Low SES	55.6 (.02)	Ref	54.9 (.02)	Ref	53.2 (.02)	Ref	50.2 (.02)	Ref
Mid-SES	59.3 (.01)		60.8 (.01)**	**	60.0 (.01)*	*	61.2 (.01)***	***
High SES	68.2 (.01)***	***	65.4 (.02)***	***	67.2 (.01)***	***	65.9 (.02)***	***
Pop. Density								
Large MSA	63.0 (.02)	Ref	61.5 (.01)	Ref	60.1 (.01)	Ref	60.8 (.01)	Ref
Other MSA	59.8 (.01)		60.3 (.01)		61.7 (.01)		61.2 (.01)	
Non-MSA	60.8 (.02)		59.6 (.02)		58.5 (.02)		57.6 (.02)	
Region								
Northeast	61.3 (.03)	Ref	62.4 (.02)	Ref	60.9 (.02)	Ref	57.7 (.02)	Ref
North Central	62.9 (.01)		59.0 (.01)		60.4 (.01)		59.9 (.02)	
South	59.0 (.02)		60.7 (.01)		59.8 (.01)		61.0 (.01)	
West	60.8 (.02)		60.0 (.02)		61.5 (.02)		60.8 (.01)	
Total Females	48.1 (.01)		49.0 (.01)		48.1 (.01)		49.2 (.01)	
Race/Ethnicity								
White	52.5 (.01)	Ref	53.5 (.01)	Ref	53.0 (.01)	Ref	53.0 (.01)	Ref
Black	36.8 (.02)***	***	35.3 (.02)***	***	33.7 (.02)***	***	38.6 (.02)***	***
Hispanic	37.8 (.02)***	***	39.1 (.03)***	**	38.0 (.02)***	***	38.9 (.03)***	**
SES								
Low SES	38.4 (.02)	Ref	38.7 (.02)	Ref	35.4 (.02)	Ref	36.9 (.02)	Ref
Mid-SES	48.1 (.01)***	***	48.0 (.01)***	***	49.2 (.01)***	***	49.0 (.01)***	***
High SES	59.3 (.02)***	***	63.5 (.01)***	***	57.2 (.02)***	***	59.1 (.02)***	***
Pop. Density								
Large MSA	48.2 (.02)	Ref	48.1 (.02)	Ref	45.4 (.02)	Ref	46.2 (.02)	Ref
Other MSA	47.9 (.01)		49.4 (.01)		49.1 (.01)		49.6 (.02)	
Non-MSA	48.4 (.02)		49.0 (.02)		48.9 (.02)		51.6 (.02)	
Region		Ref		Ref		Ref		Ref
Northeast	50.1 (.02)		52.6 (.02)		51.2 (.02)		47.5 (.03)	
North Central	48.3 (.02)		48.5 (.02)		50.1 (.02)		53.2 (.02)	
South	46.2 (.02)		47.5 (.02)		43.7 (.01)***		46.3 (.02)	
West	49.9 (.01)		50.0 (.02)		51.8 (.02)		50.5 (.03)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 20. Frequent Vigorous Exercise (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	% (se)		% (se)		% (se)		% (se)	
Total Males	59.3 (.01)		57.5 (.01)		54.5 (.01)		52.7 (.01)	
Race/Ethnicity								
White	59.3 (.01)	Ref	57.1 (.01)	Ref	53.9 (.01)	Ref	52.9 (.01)	Ref
Black	59.3 (.03)		59.1 (.02)		57.8 (.03)	*	55.3 (.02)	
Hispanic	59.8 (.03)		59.2 (.02)		55.1 (.03)		48.6 (.02)*	
SES								
Low SES	52.3 (.02)	Ref	48.0 (.02)	Ref	46.3 (.03)	Ref	46.5 (.02)	Ref
Mid-SES	59.2 (.01)**	***	57.8 (.01)***	***	53.9 (.01)**	***	52.1 (.01)*	*
High SES	64.8 (.01)***	***	62.2 (.02)***	***	62.2 (.01)***	***	58.8 (.02)***	***
Pop. Density								
Large MSA	60.1 (.02)	Ref	61.0 (.02)	Ref	52.8 (.02)	Ref	53.0 (.01)	Ref
Other MSA	59.8 (.01)		57.0 (.01)		55.4 (.01)		53.5 (.01)	
Non-MSA	57.9 (.02)		56.0 (.02)*		54.5 (.02)		50.8 (.02)	
Region								
Northeast	57.4 (.02)	Ref	61.0 (.02)	Ref	53.3 (.02)	Ref	53.7 (.02)	Ref
North Central	59.6 (.01)		53.5 (.01)***	***	53.2 (.02)		52.8 (.01)	
South	57.7 (.02)		56.5 (.01)**		54.7 (.02)		52.5 (.01)	
West	63.8 (.02)*	*	62.5 (.01)		57.0 (.02)	*	52.0 (.02)	
Total Females	40.5 (.01)		41.9 (.01)		39.8 (.01)		40.7 (.01)	
Race/Ethnicity								
White	42.3 (.01)	Ref	43.3 (.01)	Ref	41.6 (.01)	Ref	42.2 (.01)	Ref
Black	31.5 (.03)***	**	32.5 (.02)***	***	30.2 (.02)***	**	34.1 (.02)***	**
Hispanic	36.3 (.02)*		40.5 (.02)		39.4 (.02)		39.3 (.02)	
SES								
Low SES	30.0 (.01)	Ref	30.1 (.02)	Ref	32.0 (.02)	Ref	30.3 (.02)	Ref
Mid-SES	40.3 (.01)***	***	41.0 (.01)***	***	37.5 (.01)*	*	39.5 (.01)***	***
High SES	51.4 (.01)***	***	54.0 (.01)***	***	53.3 (.02)***	***	52.1 (.01)***	***
Pop. Density								
Large MSA	43.5 (.02)	Ref	44.6 (.02)	Ref	40.1 (.02)	Ref	43.2 (.01)	Ref
Other MSA	39.7 (.01)	*	41.3 (.02)		41.1 (.01)		41.0 (.01)	
Non-MSA	40.0 (.02)		41.0 (.02)		37.2 (.02)		37.1 (.02)**	*
Region								
Northeast	41.9 (.03)	Ref	48.2 (.02)	Ref	42.5 (.02)	Ref	41.2 (.01)	Ref
North Central	41.4 (.02)		38.1 (.02)***	***	39.3 (.02)		41.1 (.01)	
South	36.2 (.02)		37.8 (.01)***	***	36.0 (.02)*		38.6 (.01)	
West	45.9 (.02)		50.1 (.01)		45.4 (.02)	**	43.8 (.02)	*

NOTE: In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

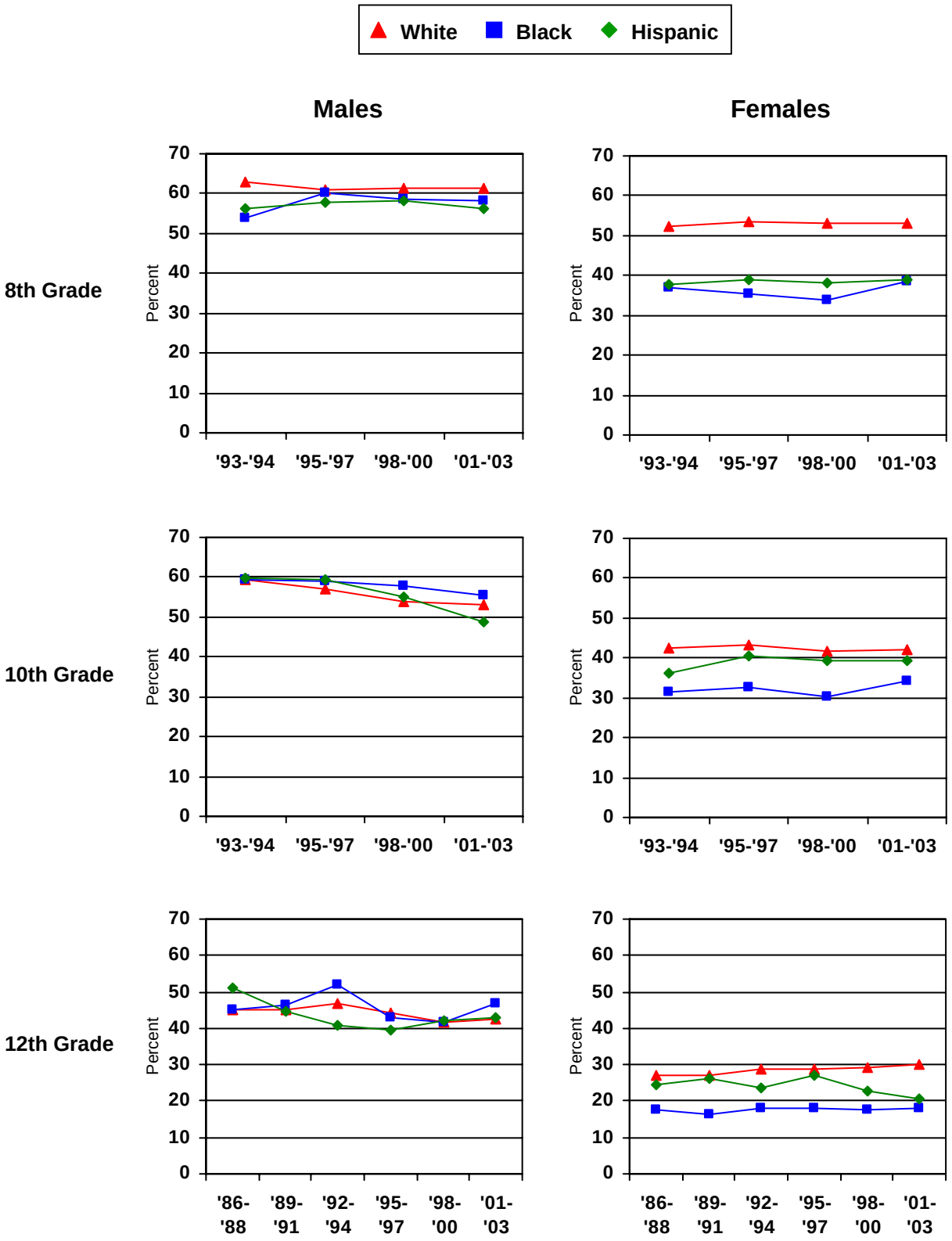
Table 21. Frequent Vigorous Exercise (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Grade 12

Characteristic	1986-1988 % (se)	Mult[a]	1989-1991 % (se)	Mult[a]	1992-1994 % (se)	Mult[a]	1995-1997 % (se)	Mult[a]	1998-2000 % (se)	Mult[a]	2001-2003 % (se)	Mult[a]
Total Males	45.4 (.01)		45.2 (.01)		46.7 (.01)		43.6 (.01)		41.7 (.01)		43.1 (.01)	
Race/Ethnicity												
White	45.1 (.01)	Ref	45.2 (.01)	Ref	46.6 (.01)	Ref	44.2 (.01)	Ref	41.7 (.01)	Ref	42.6 (.02)	Ref
Black	45.0 (.03)		46.2 (.04)		52.1 (.05)		43.0 (.03)		41.8 (.03)		46.6 (.05)	
Hispanic	50.9 (.04)	**	44.5 (.04)		40.9 (.04)		39.3 (.04)		42.1 (.05)		43.1 (.04)	
SES												
Low SES	38.7 (.02)	Ref	41.0 (.03)	Ref	36.8 (.02)	Ref	35.7 (.03)	Ref	37.3 (.04)	Ref	33.0 (.03)	Ref
Mid-SES	44.6 (.01)*	*	44.2 (.01)		47.9 (.01)***	***	44.0 (.01)*	*	40.7 (.01)		43.3 (.02)**	**
High SES	54.8 (.02)***	***	52.6 (.03)**	**	50.9 (.02)***	***	45.9 (.02)*	*	46.7 (.02)*	*	48.5 (.02)***	***
Pop. Density												
Large MSA	45.4 (.02)	Ref	44.8 (.02)	Ref	47.5 (.02)	Ref	45.2 (.02)	Ref	43.0 (.02)	Ref	44.8 (.02)	Ref
Other MSA	45.5 (.02)		46.8 (.02)		45.2 (.01)		43.1 (.02)		41.9 (.02)		42.6 (.02)	
Non-MSA	45.4 (.02)		42.6 (.03)		48.6 (.03)		43.1 (.02)		40.3 (.03)		42.3 (.03)	
Region												
Northeast	49.4 (.03)	Ref	45.9 (.03)	Ref	52.6 (.03)	Ref	45.4 (.02)	Ref	40.2 (.03)	Ref	40.4 (.01)	Ref
North Central	42.4 (.01)*	*	43.3 (.02)		44.9 (.02)**	*	42.9 (.02)		41.1 (.02)		44.6 (.03)	
South	43.6 (.02)		44.4 (.02)		45.8 (.03)		42.5 (.02)		41.0 (.02)		40.9 (.02)	
West	49.4 (.02)		49.1 (.03)		47.0 (.02)		45.4 (.02)		45.2 (.02)		47.4 (.02)*	*
Total Females	25.7 (.01)		25.6 (.01)		27.0 (.01)		27.3 (.01)		26.9 (.01)		27.3 (.01)	
Race/Ethnicity												
White	26.9 (.01)	Ref	26.9 (.01)	Ref	28.9 (.01)	Ref	28.8 (.01)	Ref	29.2 (.01)	Ref	30.1 (.01)	Ref
Black	17.7 (.02)**		16.5 (.02)***	**	18.1 (.02)***	**	17.9 (.02)***	**	17.7 (.02)***	**	18.0 (.02)***	**
Hispanic	24.3 (.03)		26.1 (.04)		23.6 (.03)		27.1 (.03)		22.7 (.03)		20.6 (.03)**	
SES												
Low SES	18.4 (.02)	Ref	17.3 (.02)	Ref	17.3 (.02)	Ref	17.3 (.02)	Ref	19.1 (.02)	Ref	16.1 (.03)	Ref
Mid-SES	26.8 (.01)***	***	26.4 (.01)***	**	26.1 (.01)***	**	27.1 (.02)***	***	26.5 (.02)**		28.1 (.01)**	**
High SES	31.3 (.02)***	***	34.1 (.02)***	***	40.5 (.02)***	***	35.0 (.03)***	***	34.5 (.02)***	**	33.6 (.02)***	***
Pop. Density												
Large MSA	25.1 (.01)	Ref	27.7 (.02)	Ref	31.0 (.01)	Ref	26.6 (.03)	Ref	27.2 (.02)	Ref	28.4 (.02)	Ref
Other MSA	25.4 (.01)		25.6 (.01)		25.2 (.01)**	*	27.0 (.02)		29.5 (.02)		24.7 (.02)	*
Non-MSA	26.8 (.02)		23.9 (.02)		26.8 (.02)		28.4 (.03)		22.2 (.03)		30.5 (.03)	
Region												
Northeast	28.5 (.03)	Ref	27.4 (.03)	Ref	31.8 (.02)	Ref	30.7 (.03)	Ref	31.5 (.03)	Ref	27.7 (.02)	Ref
North Central	27.3 (.02)		26.2 (.02)		28.2 (.02)		25.3 (.03)		28.6 (.03)		31.0 (.03)	
South	20.5 (.02)**	*	21.3 (.01)*		23.6 (.02)**	*	26.8 (.02)		23.0 (.02)**		24.2 (.02)	
West	29.9 (.02)		31.1 (.02)		27.7 (.02)		28.3 (.02)		28.4 (.03)		27.4 (.03)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 6. Frequent Vigorous Exercise (Nearly Every Day or Every Day): Levels and Trends by Gender, Race/Ethnicity, and Grade



Sleeping Habits

Racial/ethnic differences. At 8th grade, a smaller proportion of Hispanic and Black males than White males got at least seven hours of sleep on a regular basis (nearly every day or every day) in the 1993–1994 years, but since then the differences have not been statistically significant (see Table 22; see also Figure 7 for a graphic representation of these results by gender, race/ethnicity, and grade). One exception is in the 2001–2003 years, when Hispanic males were less likely to get sufficient sleep than White males. There was a lower proportion of Hispanic females who got sufficient sleep in the early and mid-1990s, but these differences became nonsignificant in the more recent periods.

Among 10th graders, some racial/ethnic differences in the frequency of getting at least seven hours of sleep is observed in the most recent years, when there has been a *greater* proportion of Hispanic and Black females getting sufficient sleep than White females (see Table 23).

Among 12th graders there are no racial/ethnic differences in the proportion of youth who get at least seven hours of sleep, the exception being the larger proportion of Black females in the 1992–1994 period but not in the more recent years (see Table 24). Perhaps a more interesting finding is the substantial decrease in the percent of all youth who get at least seven hours of sleep on a regular basis; this occurred for both genders in all three grades, as well as across all three racial/ethnic groups.

In sum, this lifestyle factor does not differ much by race/ethnicity; and the fact that all three groups are showing declines in their overall amount of sleep suggests that cultural-wide influences are at work here.

SES differences. The proportion of 8th- and 10th-grade males and females of mid- and high-SES levels who get at least seven hours of sleep on a regular basis is significantly higher than the proportion of low-SES youth who do so (see Tables 22 and 23). However, among 10th-grade females, there are no significant differences associated with SES from the mid-1990s through the most recent years (see Table 23). Among 12th graders, differences in the proportion of youth who get at least seven hours of sleep are observed mostly between high- and low-SES youth and not between mid- and low-SES youth (see Table 24).

Population density and regional differences. Among 12th graders, and also among 10th-grade males, the proportion who get at least seven hours of sleep tends to be highest in the non-MSA areas, though the differences are often not statistically significant (see Tables 22, 23, and 24). There are some small regional differences but no consistent patterns over time.

Table 22. Getting Seven Hours of Sleep Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

	Grade 8							
Characteristic	**1993-1994**	**Mult[a]**	**1995-1997**	**Mult[a]**	**1998-2000**	**Mult[a]**	**2001-2003**	**Mult[a]**
	% (se)		**% (se)**		**% (se)**		**% (se)**	
Total Males	68.5 (.01)		68.6 (.01)		63.2 (.01)		62.9 (.01)	
Race/Ethnicity								
White	71.0 (.01)	Ref	69.5 (.01)	Ref	64.2 (.01)	Ref	64.6 (.01)	Ref
Black	63.4 (.02)***	***	66.9 (.02)		60.8 (.02)		60.4 (.02)	
Hispanic	59.6 (.03)***	***	65.3 (.03)		60.0 (.02)		55.8 (.02)***	***
SES								
Low SES	62.8 (.02)	Ref	65.9 (.02)	Ref	57.6 (.02)	Ref	57.0 (.03)	Ref
Mid-SES	67.8 (.01)*		69.8 (.01)		64.1 (.01)*	*	62.9 (.01)*	
High SES	74.7 (.01)***	***	69.4 (.01)		66.8 (.01)**	**	66.1 (.01)***	*
Pop. Density								
Large MSA	67.5 (.02)	Ref	68.9 (.02)	Ref	63.9 (.01)	Ref	62.0 (.02)	Ref
Other MSA	68.5 (.01)		67.8 (.01)		62.1 (.01)		63.3 (.01)	
Non-MSA	69.2 (.02)		69.8 (.02)		64.6 (.01)		62.9 (.02)	
Region								
Northeast	68.8 (.02)	Ref	72.1 (.01)	Ref	60.9 (.02)	Ref	61.0 (.02)	Ref
North Central	71.6 (.01)		66.7 (.02)*	**	66.0 (.01)*	*	64.3 (.02)	
South	65.5 (.01)		66.9 (.02)*	*	62.5 (.01)		61.7 (.01)	
West	69.7 (.02)		71.8 (.02)		63.2 (.02)		65.1 (.02)	
Total Females	60.7 (.01)		59.7 (.01)		56.3 (.01)		54.8 (.01)	
Race/Ethnicity								
White	62.4 (.01)	Ref	61.2 (.01)	Ref	57.3 (.01)	Ref	55.1 (.01)	Ref
Black	58.5 (.02)*		58.1 (.02)		53.8 (.02)		56.1 (.02)	
Hispanic	52.6 (.03)**	*	51.6 (.02)***	***	54.1 (.02)		51.4 (.03)	
SES								
Low SES	56.1 (.02)	Ref	54.3 (.02)	Ref	52.0 (.02)	Ref	49.4 (.02)	Ref
Mid-SES	61.7 (.01)*		58.8 (.01)*		55.9 (.01)		54.1 (.01)*	
High SES	63.4 (.01)**	*	67.2 (.02)***	***	60.2 (.02)**	*	60.7 (.02)***	***
Pop. Density								
Large MSA	63.3 (.01)	Ref	59.1 (.01)	Ref	54.9 (.02)	Ref	55.7 (.01)	Ref
Other MSA	57.7 (.01)***	***	59.4 (.01)		56.5 (.01)		53.6 (.01)	
Non-MSA	64.9 (.02)		60.5 (.01)		57.3 (.02)		55.9 (.02)	
Region		Ref		Ref		Ref		Ref
Northeast	59.6 (.01)		61.7 (.02)		58.9 (.02)		55.4 (.02)	
North Central	60.9 (.02)		58.9 (.02)		55.6 (.01)		52.9 (.01)	
South	60.1 (.01)		58.4 (.01)		55.8 (.02)		54.3 (.01)	
West	62.6 (.02)	*	61.9 (.02)		56.1 (.02)		58.1 (.02)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 23. Getting Seven Hours of Sleep Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10								
Characteristic	**1993-1994**	**Mult[a]**	**1995-1997**	**Mult[a]**	**1998-2000**	**Mult[a]**	**2001-2003**	**Mult[a]**
	% (se)		**% (se)**		**% (se)**		**% (se)**	
Total Males	57.1 (.01)		55.6 (.01)		50.5 (.01)		48.5 (.01)	
Race/Ethnicity								
White	57.3 (.01)	Ref	56.0 (.01)	Ref	50.5 (.01)	Ref	48.3 (.01)	Ref
Black	55.6 (.03)		51.5 (.02)*		48.1 (.03)		50.0 (.02)	
Hispanic	56.1 (.03)		56.6 (.02)		52.9 (.03)		48.5 (.02)	
SES								
Low SES	52.6 (.02)	Ref	48.7 (.02)	Ref	47.8 (.02)	Ref	44.7 (.02)	Ref
Mid-SES	57.2 (.01)*	*	56.5 (.01)***	***	50.2 (.01)		48.6 (.01)	
High SES	59.5 (.01)**	**	57.9 (.01)***	***	53.4 (.02)*	***	50.3 (.02)	*
Pop. Density								
Large MSA	53.8 (.02)	Ref	55.6 (.02)	Ref	47.1 (.02)	Ref	46.6 (.02)	Ref
Other MSA	57.2 (.01)		54.8 (.01)		51.1 (.02)	*	48.6 (.01)	
Non-MSA	58.7 (.02)		57.6 (.02)	*	52.7 (.02)*	**	50.7 (.01)	
Region								
Northeast	56.4 (.02)	Ref	57.7 (.01)	Ref	48.3 (.01)	Ref	48.1 (.01)	Ref
North Central	57.7 (.01)		51.5 (.01)***	***	48.8 (.02)		45.3 (.01)	*
South	55.3 (.02)		54.3 (.01)		49.7 (.02)		50.3 (.02)	
West	59.6 (.02)		63.4 (.02)*	*	56.3 (.02)**	**	50.2 (.02)	
Total Females	45.8 (.01)		42.8 (.01)		39.2 (.01)		37.4 (.01)	
Race/Ethnicity								
White	45.4 (.01)	Ref	42.3 (.01)	Ref	37.9 (.01)	Ref	35.9 (.01)	Ref
Black	48.4 (.02)		45.0 (.02)		40.5 (.02)	*	42.5 (.02)***	***
Hispanic	46.1 (.02)		44.5 (.02)		45.7 (.02)***	***	40.0 (.03)	
SES								
Low SES	43.7 (.02)	Ref	42.1 (.01)	Ref	39.5 (.02)	Ref	37.8 (.02)	Ref
Mid-SES	45.4 (.01)		42.1 (.01)		38.4 (.01)		36.8 (.01)	
High SES	49.0 (.01)*	**	44.4 (.01)		40.6 (.02)	*	38.7 (.02)	
Pop. Density								
Large MSA	44.6 (.01)	Ref	41.5 (.02)	Ref	36.4 (.02)	Ref	36.0 (.02)	Ref
Other MSA	44.0 (.01)		42.2 (.01)		38.8 (.02)		38.1 (.01)	*
Non-MSA	50.1 (.02)*	**	44.8 (.01)	**	42.8 (.02)**	***	37.6 (.01)	**
Region								
Northeast	47.4 (.03)	Ref	45.4 (.01)	Ref	35.8 (.02)	Ref	37.8 (.02)	Ref
North Central	44.5 (.01)		41.3 (.01)*	*	38.8 (.02)		35.1 (.02)	
South	45.2 (.02)		41.2 (.01)*	**	38.3 (.02)		36.3 (.01)	
West	47.8 (.01)		45.8 (.02)		45.1 (.02)***	**	42.9 (.02)*	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

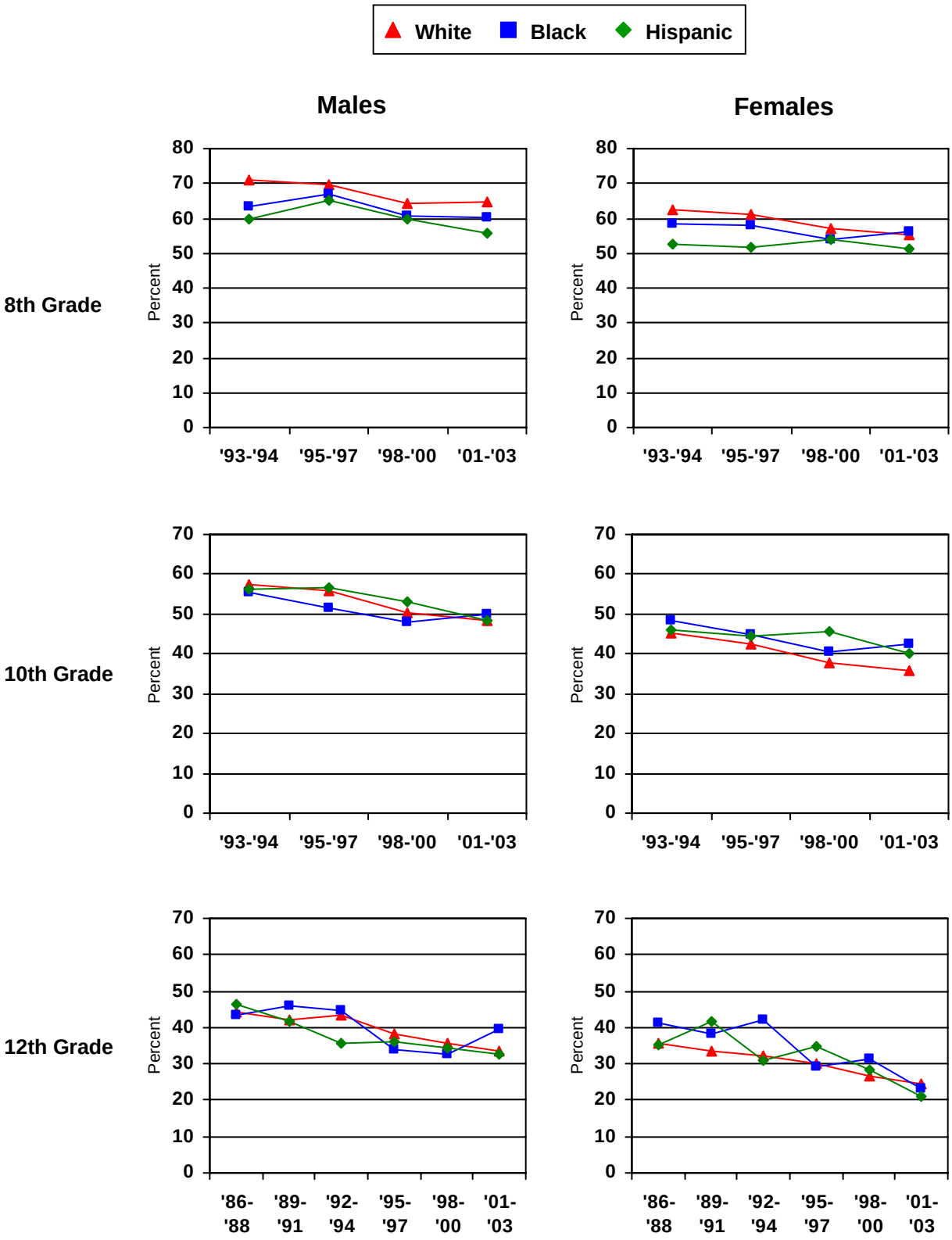
Table 24. Getting Seven Hours of Sleep Regularly (Nearly Every Day or Every Day): Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Grade 12

Characteristic	1986-1988 % (se)	Mult[a]	1989-1991 % (se)	Mult[a]	1992-1994 % (se)	Mult[a]	1995-1997 % (se)	Mult[a]	1998-2000 % (se)	Mult[a]	2001-2003 % (se)	Mult[a]
Total Males	44.3 (.01)		42.4 (.01)		42.8 (.01)		37.8 (.01)		35.2 (.01)		34.2 (.01)	
Race/Ethnicity												
White	44.2 (.01)	Ref	42.1 (.01)	Ref	43.4 (.01)	Ref	38.4 (.01)	Ref	35.6 (.01)	Ref	33.7 (.01)	Ref
Black	43.2 (.03)		46.0 (.03)		44.5 (.03)		33.9 (.04)		32.8 (.03)		39.5 (.04)	
Hispanic	46.3 (.04)		41.5 (.03)		35.6 (.05)		36.1 (.04)		34.5 (.04)		32.5 (.03)	
SES												
Low SES	41.8 (.02)	Ref	41.6 (.03)	Ref	41.4 (.03)	Ref	37.2 (.03)	Ref	32.2 (.03)	Ref	33.4 (.03)	Ref
Mid-SES	43.5 (.01)		41.7 (.01)		43.5 (.02)		37.5 (.02)		34.6 (.02)		31.3 (.02)	
High SES	49.9 (.02)*	**	45.7 (.03)		43.5 (.03)		39.6 (.02)		38.2 (.02)		41.6 (.02)*	*
Pop. Density												
Large MSA	42.3 (.02)	Ref	39.7 (.02)	Ref	40.4 (.02)	Ref	34.2 (.02)	Ref	36.5 (.02)	Ref	32.9 (.01)	Ref
Other MSA	43.3 (.02)		43.0 (.02)		41.2 (.02)		37.3 (.02)		33.2 (.02)		33.1 (.02)	
Non-MSA	47.5 (.02)	*	43.5 (.03)		47.3 (.03)*	*	41.4 (.02)*	*	37.3 (.03)		37.2 (.02)	**
Region												
Northeast	44.9 (.02)	Ref	39.2 (.02)	Ref	47.6 (.04)	Ref	37.3 (.03)	Ref	35.2 (.03)	Ref	30.0 (.03)	Ref
North Central	41.0 (.02)		42.3 (.03)		40.8 (.02)		36.0 (.02)		36.4 (.02)		31.8 (.02)	
South	44.8 (.02)		42.0 (.02)		42.8 (.02)		38.0 (.01)		30.9 (.02)		36.1 (.02)	
West	47.9 (.02)		46.2 (.02)*	*	42.8 (.03)		40.5 (.03)		41.6 (.03)		37.7 (.02)*	**
Total Females	36.4 (.01)		34.8 (.01)		33.1 (.01)		30.4 (.01)		27.5 (.01)		24.0 (.01)	
Race/Ethnicity												
White	35.8 (.01)	Ref	33.7 (.01)	Ref	32.0 (.01)	Ref	30.1 (.01)	Ref	26.7 (.01)	Ref	24.6 (.01)	Ref
Black	41.2 (.03)	*	38.4 (.02)		42.2 (.03)**	***	29.4 (.03)		31.5 (.03)	*	23.4 (.03)	
Hispanic	35.3 (.03)		41.5 (.03)*	*	30.8 (.03)		34.7 (.03)		28.2 (.03)		20.9 (.02)	
SES												
Low SES	36.6 (.02)	Ref	33.7 (.02)	Ref	35.0 (.03)	Ref	30.8 (.03)	Ref	27.3 (.02)	Ref	21.5 (.03)	Ref
Mid-SES	36.5 (.01)		34.7 (.01)		33.5 (.01)		29.6 (.01)		26.2 (.02)		22.8 (.01)	
High SES	35.5 (.02)		37.8 (.02)	*	30.1 (.02)		32.2 (.02)**		32.5 (.02)	*	29.6 (.02)*	*
Pop. Density												
Large MSA	34.2 (.02)	Ref	32.5 (.02)	Ref	29.9 (.01)	Ref	26.0 (.02)	Ref	25.6 (.03)	Ref	22.7 (.03)	Ref
Other MSA	33.8 (.01)		35.3 (.02)		30.9 (.01)		30.4 (.02)	*	27.2 (.01)		21.6 (.01)	
Non-MSA	42.6 (.02)**	***	35.8 (.02)		39.3 (.02)**	**	34.4 (.02)	***	30.0 (.03)		29.2 (.02)	*
Region												
Northeast	39.3 (.03)	Ref	33.5 (.02)	Ref	30.6 (.02)	Ref	33.4 (.02)	Ref	24.9 (.03)	Ref	21.0 (.03)	Ref
North Central	35.7 (.01)		32.0 (.02)		32.3 (.02)		29.0 (.02)		30.1 (.03)		24.1 (.02)	
South	35.3 (.02)	*	37.6 (.01)		34.3 (.02)		29.5 (.02)		26.8 (.02)		23.1 (.02)	
West	36.1 (.03)		35.7 (.03)		34.3 (.02)		32.1 (.02)		27.8 (.03)		28.7 (.02)*	*

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 7. Getting Seven Hours of Sleep Regularly (Nearly Every Day or Every Day) by Gender, Race/Ethnicity, and Grade



Television Viewing on Weekdays (Monday–Friday)

Racial/ethnic differences. On average, Black and Hispanic males and females in 8th, 10th, and 12th grades watch more television on weekdays than White youth across all years, with Black youth having the highest mean hours of TV viewing (see Tables 25, 26, and 27; see also Figure 8 for a graphic representation of these results by gender, race/ethnicity, and grade). Some of the differences are quite substantial: for example, in 2001–2003, White 12th-grade males watch about 9.5 hours per week (Monday–Friday), compared to 15.3 hours for Black 12th-grade males.

SES differences. TV viewing consistently has been negatively and ordinally correlated with SES at all three grade levels at least as far back as when data were first available (i.e., the early 1990s for 8th and 10th graders and the mid-1980s for 12th graders; see Tables 25, 26, and 27). The differences are quite large in 8th and 10th grades. An exception is the lack of significant differences (in the multivariate context) in hours spent watching TV by males in 12th grades during the most recent years (1998–2000 and 2001–2003; see Table 27).

Population density and regional differences. There are no consistent significant differences in the mean number of hours youth spend watching TV during weekdays by population density among 8th-, 10th-, and 12th-grade students (see Tables 25, 26, and 27). It seems that 8th-, 10th-, and 12th-grade youth from the South watch slightly more TV than youth in the other regions, particularly 8th-grade males in the two most recent periods (see Table 25).

Table 25. Mean Hours of Television Viewing on an Average Weekday: Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Characteristic	Grade 8							
	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	14.9 (7.5)		14.6 (7.6)		14.5 (7.6)		13.9 (7.7)	
Race/Ethnicity								
White	13.8 (7.2)	Ref	13.3 (7.3)	Ref	13.0 (7.3)	Ref	12.5 (7.4)	Ref
Black	18.9 (7.0)***	***	19.1 (7.1)***	***	18.8 (7.2)***	***	18.4 (7.4)***	***
Hispanic	15.9 (7.6)***	***	15.9 (7.4)***	***	16.1 (7.3)***	***	15.8 (7.5)***	***
SES								
Low SES	16.7 (7.3)	Ref	16.2 (7.5)	Ref	16.3 (7.6)	Ref	15.6 (7.9)	Ref
Mid-SES	15.1 (7.3)***	***	14.8 (7.4)***	***	14.7 (7.5)***	***	14.3 (7.5)***	**
High SES	12.9 (7.5)***	***	12.5 (7.5)***	***	12.3 (7.4)***	***	11.8 (7.5)***	***
Pop. Density								
Large MSA	14.7 (7.6)	Ref	15.2 (7.6)	Ref	14.7 (7.6)	Ref	14.4 (7.8)	Ref
Other MSA	14.5 (7.5)		14.2 (7.6)*		14.2 (7.7)		13.8 (7.7)	
Non-MSA	15.9 (7.3)*	*	14.9 (7.5)		14.6 (7.6)		13.7 (7.6)	
Region								
Northeast	14.5 (7.3)	Ref	14.2 (7.6)	Ref	13.9 (7.5)	Ref	13.5 (7.7)	Ref
North Central	14.4 (7.1)		14.4 (7.3)		13.7 (7.4)		13.1 (7.4)	
South	16.2 (7.5)**		15.5 (7.7)		15.6 (7.7)***	*	15.0 (7.8)***	**
West	13.5 (7.6)*	***	13.5 (7.5)	*	13.5 (7.7)	*	13.1 (7.8)	
Total Females	14.0 (7.6)		13.6 (7.6)		13.3 (7.6)		13.1 (7.8)	
Race/Ethnicity								
White	12.3 (7.1)	Ref	11.9 (7.1)	Ref	11.5 (7.0)	Ref	11.3 (7.1)	Ref
Black	18.9 (7.1)***	***	19.0 (7.1)***	***	18.4 (7.3)***	***	18.3 (7.5)***	***
Hispanic	15.5 (7.5)***	***	15.4 (7.3)***	***	15.7 (7.4)***	***	15.4 (7.7)***	***
SES								
Low SES	15.7 (7.5)	Ref	15.5 (7.5)	Ref	15.2 (7.6)	Ref	15.0 (7.8)	Ref
Mid-SES	14.2 (7.5)***	***	13.8 (7.5)***	***	13.5 (7.5)***	***	13.3 (7.6)***	***
High SES	11.2 (7.3)***	***	11.0 (7.3)***	***	10.8 (7.3)***	***	10.6 (7.3)***	***
Pop. Density								
Large MSA	13.8 (7.7)	Ref	14.2 (7.7)	Ref	13.8 (7.7)	Ref	13.9 (8.0)	Ref
Other MSA	13.6 (7.6)		13.3 (7.6)*		13.3 (7.7)		12.8 (7.7)*	
Non-MSA	14.8 (7.5)	**	13.8 (7.5)		12.9 (7.5)		12.6 (7.5)*	
Region								
Northeast	12.9 (7.4)	Ref	13.2 (7.3)	Ref	12.3 (7.4)	Ref	12.6 (7.6)	Ref
North Central	13.6 (7.4)		13.3 (7.4)		12.8 (7.3)	*	12.1 (7.4)	*
South	15.4 (7.7)***	*	14.7 (7.8)*		14.5 (7.8)***	**	14.3 (8.0)***	*
West	12.6 (7.4)	**	12.3 (7.4)	***	12.4 (7.7)		12.2 (7.6)	

NOTE: In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 26. Mean Hours of Television Viewing on an Average Weekday: Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10								
Characteristic	**1993-1994**	**Mult[a]**	**1995-1997**	**Mult[a]**	**1998-2000**	**Mult[a]**	**2001-2003**	**Mult[a]**
	M (sdev)		**M (sdev)**		**M (sdev)**		**M (sdev)**	
Total Males	12.7 (7.3)		12.5 (7.3)		12.6 (7.5)		12.6 (7.6)	
Race/Ethnicity								
White	11.9 (7.0)	Ref	11.5 (6.9)	Ref	11.4 (7.1)	Ref	11.2 (7.1)	Ref
Black	17.7 (7.2)***	***	17.4 (7.3)***	***	17.4 (7.4)***	***	17.1 (7.6)***	***
Hispanic	14.1 (7.4)***	***	14.4 (7.3)***	***	14.9 (7.4)***	***	14.6 (7.5)***	***
SES								
Low SES	14.8 (7.4)	Ref	14.4 (7.5)	Ref	14.5 (7.7)	Ref	14.4 (7.8)	Ref
Mid-SES	12.7 (7.1)***	***	12.6 (7.2)***	***	12.8 (7.5)***	***	12.7 (7.5)***	***
High SES	11.0 (7.0)***	***	10.6 (6.8)***	***	10.6 (7.0)***	***	10.7 (7.1)***	***
Pop. Density								
Large MSA	12.6 (7.3)	Ref	12.5 (7.5)	Ref	13.1 (7.6)	Ref	12.9 (7.8)	Ref
Other MSA	12.4 (7.2)		12.4 (7.2)		12.3 (7.5)		12.4 (7.5)	
Non-MSA	13.4 (7.3)		12.7 (7.3)	*	12.7 (7.5)		12.5 (7.5)	
Region								
Northeast	12.3 (7.1)	Ref	12.3 (7.1)	Ref	12.0 (7.4)	Ref	12.3 (7.5)	Ref
North Central	11.7 (6.9)		12.0 (7.2)		11.6 (7.2)		11.8 (7.2)	
South	14.2 (7.5)***	*	13.0 (7.4)		13.5 (7.7)***	*	13.2 (7.7)*	
West	12.2 (7.2)	*	12.2 (7.2)	*	12.9 (7.6)		12.7 (7.7)	
Total Females	11.9 (7.6)		11.5 (7.5)		11.3 (7.5)		11.3 (7.6)	
Race/Ethnicity								
White	10.5 (7.0)	Ref	10.2 (6.9)	Ref	9.7 (6.7)	Ref	9.6 (6.7)	Ref
Black	18.6 (7.2)***	***	17.6 (7.5)***	***	17.3 (7.6)***	***	17.3 (7.7)***	***
Hispanic	14.0 (7.4)***	***	14.0 (7.4)***	***	14.2 (7.3)***	***	13.6 (7.6)***	***
SES								
Low SES	14.2 (7.6)	Ref	14.0 (7.7)	Ref	13.5 (7.6)	Ref	13.6 (7.8)	Ref
Mid-SES	11.9 (7.5)***	***	11.4 (7.3)***	***	11.4 (7.4)***	***	11.3 (7.4)***	***
High SES	9.3 (6.9)***	***	9.2 (6.8)***	***	8.8 (6.7)***	***	8.9 (6.8)***	***
Pop. Density								
Large MSA	11.8 (7.9)	Ref	11.5 (7.6)	Ref	11.6 (7.6)	Ref	11.5 (7.9)	Ref
Other MSA	11.5 (7.5)		11.5 (7.4)	*	11.1 (7.4)		11.3 (7.5)	*
Non-MSA	12.7 (7.6)	***	11.5 (7.4)		11.2 (7.4)		11.2 (7.4)	**
Region						Ref		Ref
Northeast	11.3 (7.6)	Ref	11.1 (7.2)	Ref	10.5 (7.0)		10.9 (7.3)	*
North Central	10.8 (7.2)		11.0 (7.3)		10.1 (7.0)		10.2 (7.1)	
South	13.7 (7.8)***		12.4 (7.7)*		12.5 (7.8)***		12.2 (7.9)**	
West	11.2 (7.3)	**	10.9 (7.3)	***	11.6 (7.5)*		11.6 (7.7)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

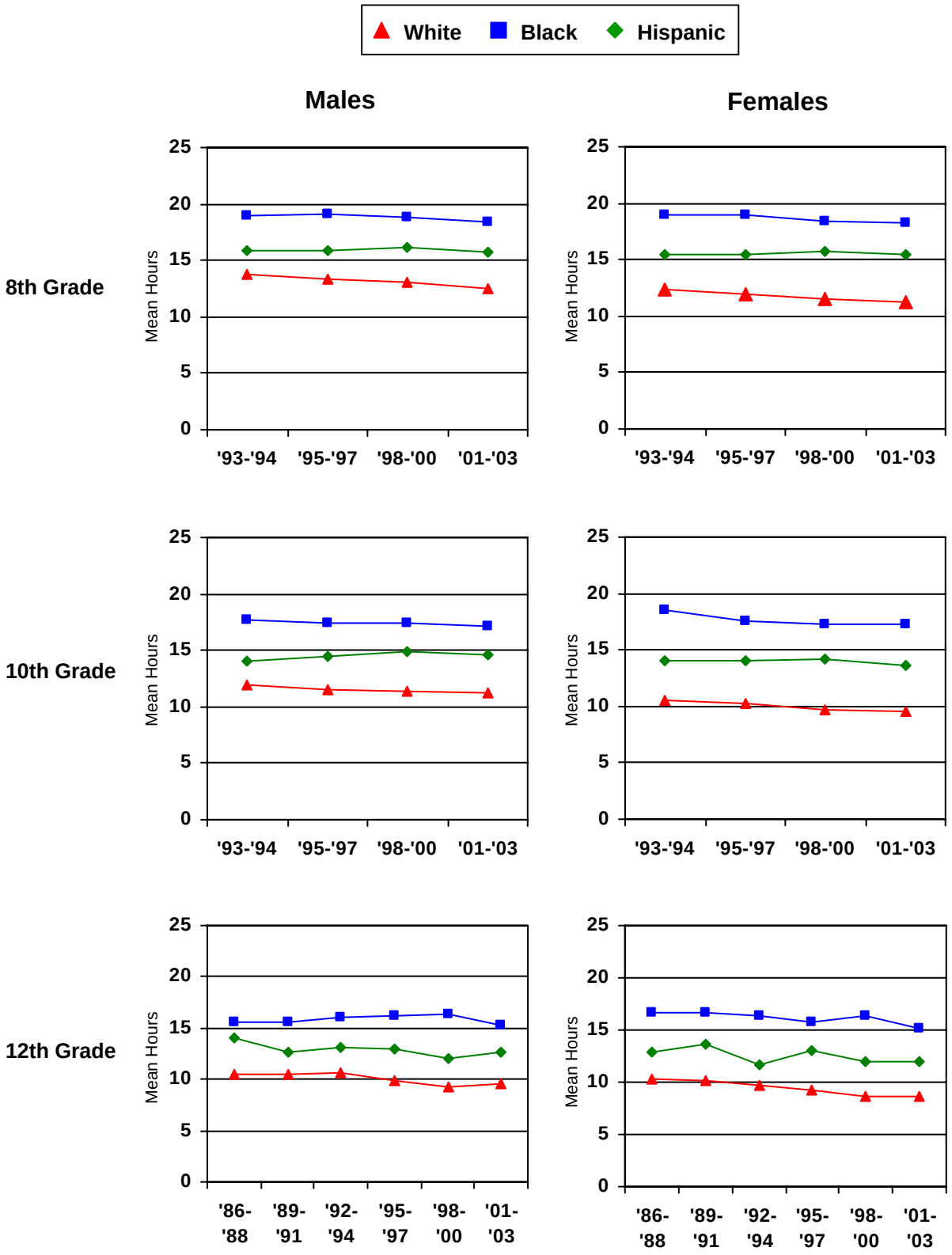
*p < 0.05. **p < 0.01. ***p < 0.001.

Table 27. Mean Hours of Television Viewing on an Average Weekday: Levels and Trends by Demographic Subgroup, 12th Grade, 1986–2003

Characteristic	Grade 12											
	1986-1988	Mult[a]	1989-1991	Mult[a]	1992-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	11.3 (7.4)		11.2 (7.3)		11.5 (7.6)		10.9 (7.5)		10.4 (7.4)		10.5 (7.5)	
Race/Ethnicity												
White	10.5 (7.1)	Ref	10.5 (7.0)	Ref	10.6 (7.2)	Ref	9.8 (7.0)	Ref	9.2 (6.9)	Ref	9.5 (7.0)	Ref
Black	15.6 (7.7)***	***	15.6 (7.7)***	***	16.0 (7.8)***	***	16.2 (8.0)***	***	16.4 (7.4)***	***	15.3 (8.0)***	***
Hispanic	14.0 (7.5)***	***	12.6 (6.9)**	*	13.1 (7.8)***	**	13.0 (7.6)***	***	12.0 (7.7)***	***	12.7 (7.6)***	***
SES												
Low SES	13.1 (7.6)	Ref	12.5 (7.3)	Ref	13.7 (7.7)	Ref	12.7 (7.8)	Ref	11.4 (7.7)	Ref	11.7 (7.8)	Ref
Mid-SES	11.4 (7.3)***	*	11.3 (7.3)**	*	11.4 (7.5)***	***	11.0 (7.4)**		10.5 (7.5)		10.5 (7.4)*	
High SES	8.8 (6.6)***	***	9.4 (6.8)***	***	10.0 (7.5)***	***	9.4 (7.1)***	**	9.1 (6.9)***		9.9 (7.4)**	
Pop. Density												
Large MSA	11.0 (7.3)	Ref	12.0 (7.3)	Ref	11.5 (7.8)	Ref	11.1 (7.4)	Ref	10.8 (7.6)	Ref	11.0 (7.6)	Ref
Other MSA	11.1 (7.4)		10.9 (7.3)*	*	11.7 (7.5)		11.0 (7.6)		10.4 (7.4)		10.6 (7.5)	
Non-MSA	11.9 (7.5)	**	11.2 (7.2)		11.3 (7.6)		10.5 (7.2)		9.9 (7.3)		9.9 (7.3)	
Region												
Northeast	11.0 (7.5)	Ref	11.3 (7.2)	Ref	11.1 (7.3)	Ref	10.5 (7.5)	Ref	10.2 (7.3)	Ref	10.5 (7.4)	Ref
North Central	10.8 (7.3)		10.3 (7.2)*		10.9 (7.5)		10.4 (7.2)		9.5 (7.1)		9.9 (7.5)	
South	12.5 (7.5)**	*	12.4 (7.4)		12.3 (7.8)*		11.6 (7.7)		11.2 (7.7)		11.3 (7.6)	
West	10.4 (7.0)		10.4 (7.0)		11.2 (7.5)		10.6 (7.4)		10.2 (7.4)		10.2 (7.3)	
Total Females	11.3 (7.4)		11.3 (7.6)		10.9 (7.4)		10.6 (7.3)		10.1 (7.3)		10.1 (7.4)	
Race/Ethnicity												
White	10.3 (7.0)	Ref	10.1 (7.1)	Ref	9.7 (6.8)	Ref	9.2 (6.6)	Ref	8.6 (6.4)	Ref	8.7 (6.6)	Ref
Black	16.7 (7.5)***	***	16.6 (7.7)***	***	16.3 (8.1)***	***	15.8 (7.4)***	***	16.4 (7.5)***	***	15.1 (8.1)***	***
Hispanic	12.9 (7.3)**	**	13.6 (7.5)***	***	11.7 (7.1)**	***	13.1 (7.7)***	***	11.9 (7.3)***	***	11.9 (7.5)***	***
SES												
Low SES	13.3 (7.7)	Ref	13.4 (7.8)	Ref	13.0 (7.9)	Ref	12.7 (7.5)	Ref	11.9 (7.3)	Ref	11.8 (7.8)	Ref
Mid-SES	11.0 (7.3)***	***	10.9 (7.4)***	***	10.8 (7.3)***	***	10.5 (7.2)***	***	9.9 (7.2)***	*	10.1 (7.4)**	
High SES	9.6 (7.2)***	***	9.3 (7.0)***	***	8.7 (6.6)***	***	8.4 (6.6)***	***	9.1 (7.0)***	*	8.5 (6.8)***	**
Pop. Density												
Large MSA	11.0 (7.2)	Ref	11.2 (7.6)	Ref	11.0 (7.7)	Ref	10.7 (7.4)	Ref	11.2 (7.8)	Ref	10.9 (7.7)	Ref
Other MSA	11.2 (7.5)		11.1 (7.5)	*	10.5 (7.2)		10.7 (7.4)		9.9 (7.1)*		9.8 (7.4)*	
Non-MSA	11.6 (7.6)		11.8 (7.6)	*	11.4 (7.5)		10.3 (7.0)		9.5 (6.9)*		9.8 (7.1)	
Region												
Northeast	10.7 (7.1)	Ref	11.3 (7.1)	Ref	10.9 (7.3)	Ref	10.3 (7.0)	Ref	10.1 (7.0)	Ref	9.7 (7.4)	Ref
North Central	10.7 (7.2)		10.6 (7.5)		9.7 (6.9)*		9.9 (6.8)		9.1 (7.0)	*	9.3 (6.9)	
South	12.7 (7.8)***	*	12.8 (7.8)*		12.4 (7.8)*		11.5 (7.6)*		11.2 (7.6)*		11.1 (7.8)*	
West	10.0 (7.1)		9.3 (7.0)**	***	9.3 (6.8)*	*	10.0 (7.5)	*	9.4 (6.9)	*	9.9 (7.4)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.
[a]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 8. Mean Hours of Television Viewing on an Average Week (not Including Weekends): Levels and Trends by Gender, Race/Ethnicity, and Grade



Television Viewing on Weekends

The demographic differences observed for TV viewing during the week are for the most part replicated in the data on TV viewing on the weekend. It should be noted, however, that data on TV viewing during weekends were not collected from 12th-grade students.

Racial/ethnic differences. On average, Black and Hispanic males and females in 8th and 10th grades watch more television during the weekends than White youth across all years, with Black youth having the highest mean hours of TV viewing (see Tables 28 and 29). White females in 10th grade watch the least amount of TV during the weekend (see Table 29).

SES differences. A greater amount of weekend TV viewing is observed among youth of low SES when compared to youth of high SES, but not mid-SES levels, for most of the years among 8th graders (see Table 28). Tenth graders of high and mid-SES watch less TV on the weekend than low-SES youth, though in the multivariate analyses, only the high–low differences are statistically significant (see Table 29).

Population density and regional differences. There are no significant differences in the mean number of hours youth spend watching TV on weekend by population density for 8th and 10th graders (see Tables 28 and 29). Students who live in the South watch slightly more TV on weekends than those who live in other regions.

Table 28. Mean Hours of Television Viewing on an Average Weekend: Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	5.5 (2.9)		5.3 (3.0)		5.3 (3.0)		5.2 (3.0)	
Race/Ethnicity								
White	5.3 (2.9)	Ref	5.1 (2.9)	Ref	5.0 (2.9)	Ref	4.9 (2.9)	Ref
Black	6.3 (3.1)***	***	6.4 (3.0)***	***	6.2 (3.1)***	***	6.1 (3.1)***	***
Hispanic	5.4 (3.0)*	*	5.5 (3.0)***	***	5.4 (3.0)***	***	5.5 (3.0)***	***
SES								
Low SES	5.7 (3.0)	Ref	5.5 (3.1)	Ref	5.4 (3.1)	Ref	5.4 (3.2)	Ref
Mid-SES	5.5 (2.9)		5.4 (3.0)		5.3 (3.0)		5.3 (2.9)	
High SES	5.1 (2.8)***	**	5.0 (2.9)***	***	4.9 (2.8)***	**	4.8 (2.8)***	***
Pop. Density								
Large MSA	5.4 (2.9)	Ref	5.4 (3.0)	Ref	5.3 (3.0)	Ref	5.3 (3.0)	Ref
Other MSA	5.4 (2.9)		5.3 (2.9)		5.2 (3.0)		5.2 (2.9)	
Non-MSA	5.7 (3.0)*	*	5.5 (3.0)		5.3 (3.0)		5.1 (3.0)	
Region								
Northeast	5.3 (2.9)	Ref	5.2 (2.9)	Ref	5.2 (2.9)	Ref	5.2 (2.9)	Ref
North Central	5.4 (2.9)		5.3 (2.9)		5.1 (2.9)		5.0 (2.9)	
South	5.9 (3.0)***	**	5.7 (3.0)**	*	5.6 (3.0)***	**	5.5 (3.0)*	
West	5.0 (2.9)*	*	4.9 (2.9)	*	5.0 (3.0)	*	4.9 (2.9)*	***
Total Females	4.8 (2.9)		4.7 (2.9)		4.7 (2.9)		4.7 (2.9)	
Race/Ethnicity								
White	4.4 (2.7)	Ref	4.3 (2.7)	Ref	4.3 (2.7)	Ref	4.4 (2.7)	Ref
Black	5.9 (3.1)***	***	5.8 (3.1)	***	5.8 (3.1)***	***	5.8 (3.1)***	***
Hispanic	4.9 (3.0)***	***	4.9 (2.9)	***	5.0 (3.0)***	***	5.0 (3.0)***	***
SES								
Low SES	5.0 (3.1)	Ref	4.9 (3.0)	Ref	4.9 (3.1)	Ref	4.9 (3.1)	Ref
Mid-SES	4.8 (2.9)		4.7 (2.9)	**	4.8 (2.8)*		4.8 (2.9)	
High SES	4.2 (2.7)***	***	4.2 (2.7)	***	4.2 (2.6)***	***	4.3 (2.7)***	***
Pop. Density								
Large MSA	4.6 (2.9)	Ref	4.8 (2.9)	Ref	4.7 (2.9)	Ref	4.9 (2.9)	Ref
Other MSA	4.7 (2.9)	**	4.5 (2.9)		4.7 (2.9)	*	4.6 (2.9)	
Non-MSA	5.0 (2.9)**	***	4.8 (2.9)		4.7 (2.9)	*	4.7 (2.9)	
Region								
Northeast	4.6 (2.8)	Ref	4.5 (2.8)	Ref	4.5 (2.7)	Ref	4.6 (2.8)	Ref
North Central	4.6 (2.8)		4.5 (2.8)		4.5 (2.8)		4.5 (2.7)	
South	5.2 (3.0)***	*	5.0 (3.0)	**	5.0 (3.0)***	*	5.1 (3.0)***	*
West	4.2 (2.8)*	***	4.2 (2.7)	*	4.5 (2.8)		4.5 (2.8)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 29. Mean Hours of Television Viewing on an Average Weekend: Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	4.8 (2.9)		4.7 (2.9)		4.6 (2.9)		4.7 (2.9)	
Race/Ethnicity								
White	4.7 (2.8)	Ref	4.5 (2.8)	Ref	4.3 (2.8)	Ref	4.3 (2.8)	Ref
Black	5.8 (3.0)***	***	5.6 (3.0)***	***	5.7 (3.0)***	***	5.7 (3.1)***	***
Hispanic	4.9 (2.9)*	*	5.1 (2.9)***	***	5.0 (2.9)***	***	5.0 (3.0)***	***
SES								
Low SES	5.1 (3.0)	Ref	4.9 (3.1)	Ref	4.9 (3.1)	Ref	4.9 (3.1)	Ref
Mid-SES	4.8 (2.8)***	*	4.7 (2.8)*		4.6 (2.9)**		4.7 (2.9)**	
High SES	4.6 (2.7)***	***	4.4 (2.7)***	***	4.3 (2.6)***	***	4.4 (2.7)***	**
Pop. Density								
Large MSA	4.8 (2.8)	Ref	4.6 (2.8)	Ref	4.7 (2.9)	Ref	4.7 (2.9)	Ref
Other MSA	4.7 (2.8)		4.7 (2.8)		4.6 (2.9)		4.6 (2.9)	
Non-MSA	5.0 (2.9)	*	4.7 (2.9)		4.6 (2.9)		4.7 (2.9)	**
Region								
Northeast	4.7 (2.8)	Ref	4.7 (2.8)	Ref	4.5 (2.8)	Ref	4.5 (2.8)	Ref
North Central	4.7 (2.8)		4.6 (2.8)		4.3 (2.8)		4.5 (2.8)	
South	5.1 (3.0)**		4.8 (2.9)		4.9 (2.9)***	*	4.9 (3.0)**	
West	4.6 (2.8)	*	4.5 (2.8)		4.6 (2.9)		4.6 (2.9)	
Total Females	4.2 (2.8)		4.0 (2.8)		4.0 (2.7)		4.1 (2.8)	
Race/Ethnicity								
White	3.9 (2.7)	Ref	3.8 (2.6)	Ref	3.7 (2.6)	Ref	3.7 (2.6)	Ref
Black	5.7 (3.1)***	***	5.4 (3.1)***	***	5.3 (3.0)***	***	5.5 (3.1)***	***
Hispanic	4.5 (2.9)***	***	4.4 (2.8)***	***	4.5 (2.8)***	***	4.5 (2.9)***	***
SES								
Low SES	4.5 (3.0)	Ref	4.3 (2.9)	Ref	4.3 (2.9)	Ref	4.5 (3.1)	Ref
Mid-SES	4.2 (2.8)***		4.1 (2.8)***		4.0 (2.7)***		4.1 (2.8)***	
High SES	3.8 (2.6)***	***	3.7 (2.5)***	***	3.6 (2.5)***	***	3.6 (2.5)***	***
Pop. Density								
Large MSA	4.1 (2.8)	Ref	3.9 (2.8)	Ref	4.0 (2.8)	Ref	4.1 (2.8)	Ref
Other MSA	4.1 (2.8)		4.0 (2.7)	**	3.9 (2.7)		4.1 (2.8)	*
Non-MSA	4.5 (2.9)*	***	4.2 (2.8)	**	4.1 (2.7)	*	4.2 (2.8)	***
Region								
Northeast	4.1 (2.8)	Ref	4.0 (2.6)	Ref	3.8 (2.6)	Ref	4.1 (2.7)	Ref
North Central	4.0 (2.7)		4.0 (2.7)		3.7 (2.6)	*	3.8 (2.7)	*
South	4.5 (3.0)**		4.2 (2.9)*		4.3 (2.9)***		4.4 (2.9)*	
West	4.0 (2.7)		3.9 (2.7)	*	4.0 (2.7)		4.1 (2.8)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Television Viewing During the Entire Week

Racial/ethnic differences. The mean hours of TV viewing during the entire week follow the same patterns as those described earlier. On average, Black and Hispanic males and females in 8th and 10th grades watch significantly more TV during the entire week than White youth across all years, with Black youth having the highest mean hours of TV viewing (see Tables 30 and 31).

SES differences. A greater amount of TV viewing is observed among youth of low SES when compared to youth of mid- and high SES across all years among 8th- and 10th-grade students (see Tables 30 and 31).

Population density and regional differences. Among 8th and 10th graders, there are no significant differences in the mean number of hours youth spend watching TV during the entire week by population density, but there some differences according to the region of residence (see Tables 30 and 31). For most years, though not all, youth who live in the South watch more hours of TV than youth who live in other regions.

Table 30. Mean Hours of Television Viewing on an Average Week (Weekdays and Weekends Combined): Levels and Trends by Demographic Subgroup, 8th Grade, 1993–2003

Grade 8

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	20.4 (9.5)		19.9 (9.6)		19.7 (9.7)		19.1 (9.8)	
Race/Ethnicity								
White	19.0 (9.1)	Ref	18.4 (9.3)	Ref	18.0 (9.3)	Ref	17.4 (9.4)	Ref
Black	25.1 (9.1)***	***	25.3 (9.0)***	***	25.0 (9.1)***	***	24.4 (9.2)***	***
Hispanic	21.3 (9.5)***	***	21.2 (9.4)***	***	21.4 (9.3)***	***	21.2 (9.6)***	***
SES								
Low SES	22.4 (9.3)	Ref	21.6 (9.6)	Ref	21.6 (9.7)	Ref	20.9 (10.1)	Ref
Mid-SES	20.6 (9.3)***	***	20.2 (9.4)***	***	20.0 (9.5)***	**	19.5 (9.5)***	*
High SES	18.0 (9.5)***	***	17.4 (9.5)***	***	17.1 (9.4)***	***	16.6 (9.5)***	***
Pop. Density								
Large MSA	20.1 (9.5)	Ref	20.5 (9.6)	Ref	20.0 (9.6)	Ref	19.7 (9.8)	Ref
Other MSA	19.9 (9.4)		19.4 (9.6)*		19.4 (9.7)		18.9 (9.7)	
Non-MSA	21.6 (9.3)*	*	20.3 (9.6)		19.8 (9.7)		18.7 (9.7)	
Region								
Northeast	19.7 (9.2)	Ref	19.3 (9.5)	Ref	19.0 (9.4)	Ref	18.6 (9.7)	Ref
North Central	19.8 (9.1)		19.7 (9.3)		18.7 (9.5)		18.1 (9.4)	
South	22.1 (9.6)***		21.1 (9.8)*		21.1 (9.7)***	*	20.4 (9.9)***	*
West	18.4 (9.5)*	***	18.3 (9.5)	*	18.4 (9.7)	*	17.9 (9.8)	*
Total Females	18.7 (9.5)		18.3 (9.5)		18.0 (9.5)		17.7 (9.7)	
Race/Ethnicity								
White	16.7 (8.9)	Ref	16.2 (8.9)	Ref	15.7 (8.8)	Ref	15.6 (8.9)	Ref
Black	24.8 (9.0)***	***	24.7 (9.0)***	***	24.1 (9.2)***	***	24.0 (9.3)***	***
Hispanic	20.4 (9.5)***	***	20.2 (9.1)***	***	20.7 (9.2)***	***	20.4 (9.6)***	***
SES								
Low SES	20.6 (9.5)	Ref	20.3 (9.4)	Ref	20.1 (9.7)	Ref	19.8 (9.8)	Ref
Mid-SES	19.0 (9.4)***	**	18.5 (9.4)***	***	18.2 (9.3)***	***	18.1 (9.5)***	**
High SES	15.4 (9.1)***	***	15.1 (9.1)***	***	15.0 (9.1)***	***	14.8 (9.2)***	***
Pop. Density								
Large MSA	18.4 (9.6)	Ref	18.9 (9.6)	Ref	18.4 (9.5)	Ref	18.7 (9.9)	Ref
Other MSA	18.3 (9.4)		17.7 (9.5)*		17.9 (9.6)		17.4 (9.7)*	
Non-MSA	19.8 (9.5)	***	18.6 (9.5)		17.5 (9.5)		17.3 (9.5)*	
Region								
Northeast	17.5 (9.2)	Ref	17.7 (9.2)	Ref	16.7 (9.2)	Ref	17.1 (9.6)	Ref
North Central	18.2 (9.2)		17.7 (9.2)		17.3 (9.1)		16.5 (9.2)	
South	20.5 (9.7)***	**	19.6 (9.8)**		19.4 (9.8)***	**	19.3 (10.0)***	*
West	16.9 (9.3)	***	16.4 (9.2)	***	16.8 (9.5)		16.7 (9.5)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 31. Mean Hours of Television Viewing on an Average Week (Weekdays and Weekends Combined): Levels and Trends by Demographic Subgroup, 10th Grade, 1993–2003

Grade 10

Characteristic	1993-1994	Mult[a]	1995-1997	Mult[a]	1998-2000	Mult[a]	2001-2003	Mult[a]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males	17.5 (9.2)		17.1 (9.2)		17.2 (9.5)		17.2 (9.6)	
Race/Ethnicity								
White	16.5 (8.9)	Ref	16.0 (8.8)	Ref	15.6 (9.1)	Ref	15.5 (9.0)	Ref
Black	23.4 (9.0)***	***	22.9 (9.1***)	***	23.1 (9.4)***	***	22.8 (9.6)***	***
Hispanic	18.9 (9.3)***	***	19.4 (9.2)***	***	19.8 (9.3)***	***	19.6 (9.5)***	***
SES								
Low SES	19.8 (9.3)	Ref	19.3 (9.5)	Ref	19.4 (9.8)	Ref	19.3 (10.0)	Ref
Mid-SES	17.5 (9.1)***	***	17.3 (9.1)***	***	17.4 (9.5)***	***	17.3 (9.5)***	***
High SES	15.5 (8.9)***	***	15.0 (8.6)***	***	14.8 (8.9)***	***	15.0 (9.0)***	***
Pop. Density								
Large MSA	17.3 (9.1)	Ref	17.1 (9.3)	Ref	17.7 (9.5)	Ref	17.5 (9.8)	Ref
Other MSA	17.1 (9.1)		17.0 (9.1)		16.9 (9.5)		17.0 (9.5)	
Non-MSA	18.4 (9.3)	*	17.3 (9.3)	*	17.2 (9.6)		17.2 (9.6)	
Region								
Northeast	17.0 (9.0)	Ref	17.0 (9.0)	Ref	16.4 (9.3)	Ref	16.7 (9.5)	Ref
North Central	16.4 (8.8)		16.6 (9.1)		15.9 (9.2)		16.3 (9.2)	
South	19.2 (9.5)***	*	17.7 (9.4)		18.3 (9.8)***	*	18.1 (9.8)*	
West	16.7 (9.2)	**	16.7 (9.1)	**	17.4 (9.6)		17.3 (9.8)	
Total Females	16.1 (9.5)		15.6 (9.3)		15.3 (9.3)		15.4 (9.5)	
Race/Ethnicity								
White	14.4 (8.8)	Ref	14.0 (8.6)	Ref	13.3 (8.4)	Ref	13.3 (8.5)	Ref
Black	24.3 (9.0)***	***	22.9 (9.3)***	***	22.5 (9.5)***	***	22.8 (9.6)***	***
Hispanic	18.5 (9.2)***	***	18.4 (9.1)***	***	18.7 (9.0)***	***	18.1 (9.5)***	***
SES								
Low SES	18.8 (9.6)	Ref	18.3 (9.6)	Ref	17.7 (9.5)	Ref	18.1 (9.9)	Ref
Mid-SES	16.1 (9.4)***	***	15.5 (9.1)***	***	15.4 (9.2)***	***	15.5 (9.4)***	***
High SES	13.1 (8.7)***	***	12.9 (8.5)***	***	12.4 (8.4)***	***	12.5 (8.6)***	***
Pop. Density								
Large MSA	15.9 (9.8)	Ref	15.4 (9.4)	Ref	15.6 (9.4)	Ref	15.5 (9.8)	Ref
Other MSA	15.6 (9.3)	*	15.5 (9.2)	**	15.0 (9.3)		15.3 (9.4)	**
Non-MSA	17.2 (9.5)	***	15.7 (9.2)	**	15.3 (9.3)	*	15.5 (9.5)	***
Region								
Northeast	15.4 (9.3)	Ref	15.1 (9.0)	Ref	14.3 (8.8)	Ref	15.0 (9.1)	Ref
North Central	14.8 (9.0)		15.0 (9.1)		13.7 (8.7)	*	14.0 (9.0)	**
South	18.2 (9.8)***		16.6 (9.6)*		16.7 (9.7)***	*	16.6 (9.9)**	
West	15.2 (9.2)	*	14.8 (9.0)	***	15.6 (9.3)*		15.7 (9.7)	

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Computer Use

Racial/ethnic differences. All three racial/ethnic groups spend significant amounts of time on the computer for purposes unrelated to their work or school work, and all are showing an increase in the time spent. In general, White youth spend the most time on the computer and Black and Hispanic somewhat less (though not a great deal less; see Tables 32, 33, and 34; see also Figure 9 for a graphic representation of these results by gender, race/ethnicity, and grade).

SES differences. SES is generally ordinally related to computer use, with mid- and high SES youth using the computer more hours per week than low-SES youth (see Tables 32, 33, and 34).

Population density and regional differences. There are no significant differences in the mean number of hours youth spend using the computer by population density for all three grades (see Tables 32, 33, and 34). There are several regional differences. For most, but not all years, youth in 8th, 10th, and 12th grades who live in the Northeast used computers for a greater number of hours than youth living in other regions (see Tables 32, 33, and 34).

Table 32. Computer Use (Mean Hours per Week not for School or Work): Levels and Trends by Demographic Subgroup, 8th Grade, 1995–2003

Characteristic	Grade 8							
	1993-1994[a]	Mult[b]	1995-1997	Mult[b]	1998-2000	Mult[b]	2001-2003	Mult[b]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males			4.3 (6.2)		4.7 (6.2)		6.0 (6.6)	
Race/Ethnicity								
White			4.6 (6.3)	Ref	5.1 (6.3)	Ref	6.4 (6.6)	Ref
Black			3.3 (6.0)*	*	3.4 (5.5)***	***	4.9 (6.5)***	***
Hispanic			2.9 (5.5)***	**	4.0 (6.1)**		5.1 (6.3)***	*
SES								
Low SES			2.9 (5.8)	Ref	3.7 (6.0)	Ref	4.7 (6.4)	Ref
Mid-SES			4.2 (6.0)**		4.7 (6.2)**	*	6.0 (6.5)***	**
High SES			5.2 (6.5)***	**	5.3 (6.1)***	***	6.6 (6.6)***	***
Pop. Density								
Large MSA			4.5 (6.3)	Ref	5.0 (6.3)	Ref	5.9 (6.5)	Ref
Other MSA			4.5 (6.2)		4.7 (6.1)		6.1 (6.6)	
Non-MSA			3.7 (5.9)		4.5 (6.2)		5.9 (6.6)	
Region								
Northeast			5.0 (6.6)	Ref	5.6 (6.5)	Ref	7.2 (6.9)	Ref
North Central			4.4 (6.3)		5.2 (6.4)		6.2 (6.6)*	*
South			3.9 (6.0)*	*	4.2 (6.0)***	**	5.6 (6.5)***	***
West			4.2 (6.1)		4.3 (5.8)**	*	5.4 (6.2)***	***
Total Females			2.5 (4.2)		3.4 (4.8)		5.0 (5.7)	
Race/Ethnicity								
White			2.5 (4.2)	Ref	3.7 (4.8)	Ref	5.3 (5.7)	Ref
Black			2.8 (4.9)		2.8 (4.9)***	*	4.2 (5.3)***	***
Hispanic			1.7 (3.5)*		2.7 (4.4)***		4.1 (5.5)**	*
SES								
Low SES			2.0 (4.5)	Ref	2.6 (4.6)	Ref	4.6 (5.9)	Ref
Mid-SES			2.4 (4.1)		3.5 (4.8)***	***	5.0 (5.7)	
High SES			3.0 (4.5)*	*	3.9 (4.8)***	***	5.4 (5.4)*	
Pop. Density								
Large MSA			2.9 (4.7)	Ref	3.5 (4.9)	Ref	5.0 (5.6)	Ref
Other MSA			2.4 (4.0)	*	3.5 (4.9)		5.0 (5.7)	
Non-MSA			2.2 (4.2)		3.2 (4.6)		4.9 (5.7)	
Region								
Northeast			3.3 (4.9)	Ref	4.3 (5.3)	Ref	5.8 (5.9)	Ref
North Central			2.1 (3.7)**	**	3.7 (5.0)*	*	5.1 (5.6)	
South			2.4 (4.3)*	*	3.1 (4.7)***	***	4.9 (5.8)*	
West			2.2 (4.0)*	*	2.8 (3.9)***	***	4.1 (5.1)***	***

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]Data on computer use not available prior to 1995.

[b]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

Table 33. Computer Use (Mean Hours per Week not for School or Work): Levels and Trends by Demographic Subgroup, 10th Grade, 1995–2003

Grade 10

Characteristic	1993-1994[a]	Mult[b]	1995-1997	Mult[b]	1998-2000	Mult[b]	2001-2003	Mult[b]
	M (sdev)		M (sdev)		M (sdev)		M (sdev)	
Total Males			3.5 (5.4)		4.4 (5.9)		6.0 (6.6)	
Race/Ethnicity								
White			3.6 (5.4)	Ref	4.7 (6.0)	Ref	6.3 (6.6)	Ref
Black			3.2 (5.5)		3.4 (5.4)**	*	5.1 (6.3)***	**
Hispanic			2.5 (4.6)*		3.4 (5.6)**		4.8 (6.3)***	
SES								
Low SES			2.4 (4.7)	Ref	3.2 (5.4)	Ref	4.5 (6.0)	Ref
Mid-SES			3.6 (5.5)**	*	4.3 (5.9)***	**	6.0 (6.6)***	***
High SES			3.6 (5.2)**	*	5.3 (6.1)***	***	6.8 (6.6)***	***
Pop. Density								
Large MSA			3.4 (5.1)	Ref	4.9 (6.2)	Ref	6.1 (6.5)	Ref
Other MSA			3.6 (5.5)		4.4 (5.8)		6.0 (6.7)	
Non-MSA			3.3 (5.3)		4.1 (5.8)*		5.7 (6.5)	
Region								
Northeast			4.0 (5.5)	Ref	6.0 (6.7)	Ref	7.6 (6.7)	Ref
North Central			3.6 (5.5)		4.5 (5.7)***	***	6.0 (6.4)***	***
South			3.1 (5.2)**	*	3.8 (5.5)***	***	5.6 (6.5)***	***
West			3.4 (5.3)		4.1 (5.8)***	***	5.2 (6.5)***	***
Total Females			1.8 (3.5)		2.9 (4.3)		4.5 (5.4)	
Race/Ethnicity								
White			1.8 (3.6)	Ref	3.1 (4.5)	Ref	4.7 (5.4)	Ref
Black			1.9 (3.7)		2.5 (4.1)**		3.4 (5.4)**	
Hispanic			1.5 (3.0)		2.2 (3.8)***	*	3.5 (4.9)***	
SES								
Low SES			1.5 (3.2)	Ref	2.4 (4.1)	Ref	3.8 (5.3)	Ref
Mid-SES			1.8 (3.5)	*	3.0 (4.4)**		4.4 (5.3)**	
High SES			2.1 (3.7)		3.2 (4.3)***	**	5.1 (5.5)***	**
Pop. Density								
Large MSA			1.6 (3.3)	Ref	2.8 (4.1)	Ref	4.6 (5.5)	Ref
Other MSA			1.9 (3.7)		3.0 (4.5)		4.3 (5.2)	
Non-MSA			1.9 (3.6)		2.9 (4.3)		4.6 (5.6)	
Region								
Northeast			1.7 (3.5)	Ref	3.7 (4.9)	Ref	5.9 (5.9)	Ref
North Central			1.7 (3.3)		2.9 (4.1)***	***	4.5 (5.5)***	***
South			1.8 (3.5)		2.9 (4.4)**	**	4.1 (5.2)***	***
West			1.9 (3.8)		2.4 (3.9)***	***	3.5 (4.7)***	***

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column.

[a]Data on computer use not available prior to 1995.

[b]The second column indicates a significant difference from the reference group in a multivariate analysis.

*p < 0.05. **p < 0.01. ***p < 0.001.

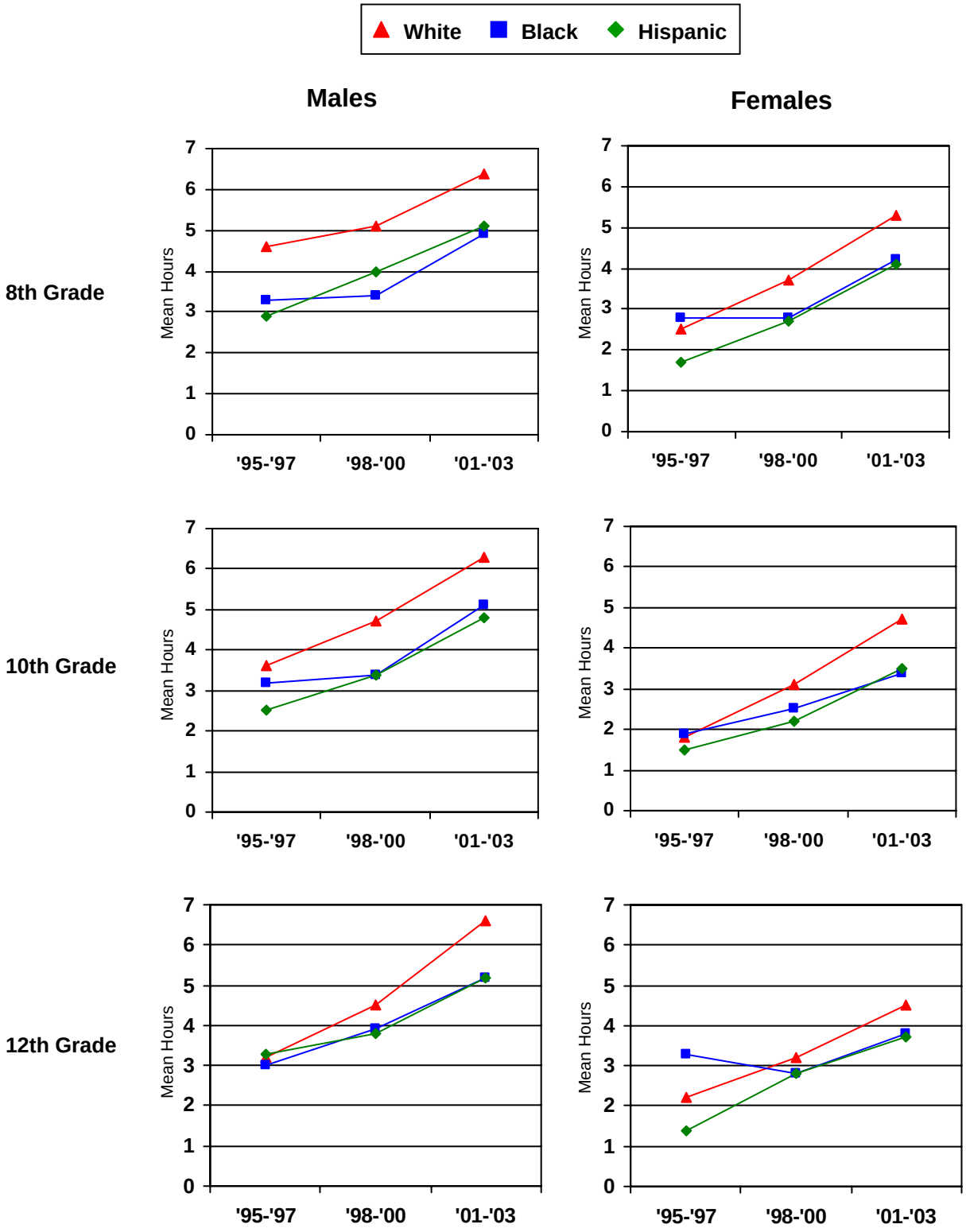
Table 34. Computer Use (Mean Hours per Week not for School or Work): Levels and Trends by Demographic Subgroup, 12th Grade, 1995–2003

Grade 12

Characteristic	1986-1988[a] M (sdev)	Mult[b]	1989-1991 M (sdev)	Mult[b]	1992-1994 M (sdev)	Mult[b]	1995-1997 M (sdev)	Mult[b]	1998-2000 M (sdev)	Mult[b]	2001-2003 M (sdev)	Mult[b]
Total Males							3.2 (5.2)		4.4 (6.0)		6.3 (6.6)	
Race/Ethnicity												
White							3.2 (5.2)	Ref	4.5 (5.9)	Ref	6.6 (6.7)	Ref
Black							3.0 (5.1)		3.9 (6.0)		5.2 (6.2)*	
Hispanic							3.3 (5.4)		3.8 (5.9)		5.2 (6.2)**	
SES												
Low SES							2.9 (5.4)	Ref	3.2 (5.3)	Ref	4.6 (6.3)	Ref
Mid-SES							2.8 (4.8)		4.2 (5.8)*	*	6.4 (6.7)**	**
High SES							4.3 (5.8)		5.5 (6.4)***	***	7.1 (6.5)***	***
Pop. Density												
Large MSA							3.3 (5.0)	Ref	4.8 (6.2)	Ref	6.7 (6.7)	Ref
Other MSA							3.6 (5.7)		4.6 (6.1)		6.4 (6.7)	
Non-MSA							2.5 (4.5)		3.6 (5.4)**	**	5.8 (6.4)	
Region												
Northeast							3.6 (5.5)	Ref	5.3 (6.4)	Ref	7.4 (6.7)	Ref
North Central							2.7 (4.8)		4.4 (6.0)		6.3 (6.6)	
South							3.7 (5.4)		4.1 (5.7)		6.0 (6.5)*	*
West							2.6 (4.9)		4.1 (5.7)		5.8 (6.6)*	
Total Females							2.3 (4.3)		3.1 (4.4)		4.3 (5.3)	
Race/Ethnicity												
White							2.2 (4.0)	Ref	3.2 (4.4)	Ref	4.5 (5.4)	Ref
Black							3.3 (5.8)		2.8 (4.3)		3.8 (5.1)	
Hispanic							1.4 (2.6)*		2.8 (4.5)		3.7 (4.6)*	
SES												
Low SES							2.6 (5.3)	Ref	2.5 (4.2)	Ref	3.3 (4.8)	Ref
Mid-SES							2.1 (3.9)		3.1 (4.4)*		4.4 (5.3)***	**
High SES							2.6 (4.1)		3.4 (4.4)**	*	4.7 (5.3)***	*
Pop. Density												
Large MSA							2.6 (4.6)	Ref	3.2 (4.4)	Ref	4.5 (5.4)	Ref
Other MSA							2.1 (3.7)		3.1 (4.4)		4.1 (5.2)	
Non-MSA							2.4 (4.8)		3.0 (4.4)		4.3 (5.2)	
Region												
Northeast							2.3 (3.9)	Ref	4.0 (5.0)	Ref	5.5 (6.1)	Ref
North Central							2.2 (4.2)		2.8 (4.2)***	**	4.3 (5.3)**	**
South							2.7 (4.8)		2.9 (4.2)***	**	4.0 (5.0)**	**
West							1.5 (3.1)		2.9 (4.3)**	**	3.5 (4.5)***	***

Note. In the bivariate analyses, significant differences between the reference group and each of the other groups are indicated in the first column. [a]Data on computer use not available prior to 1995. [b]The second column indicates a significant difference from the reference group in a multivariate analysis. *p < 0.05. **p < 0.01. ***p < 0.001.

Figure 9. Computer Use (Mean Hours per Week not for School or Work): Levels and Trends by Gender, Race/Ethnicity, and Grade



Differences in Being Overweight Related to Lifestyle Habits and Demographic Characteristics

Using data from 1993 to 2003 combined, we next look at differences in the percent of youth who are overweight for each level of each activity on the various lifestyle dimensions. This is done separately for each racial/ethnic group and for the low-SES group, within gender, as has been done throughout this paper. Results are presented here only for 8th and 10th grade, because at grade 12 many of the lifestyle questions were not asked on the same questionnaire form as the measures of height and weight. In each cell of the tables presented, the significance is given of a chi-square statistic that tests the extent to which a bivariate relationship exists between percent overweight and the lifestyle dimension. In other words, do the levels in percent overweight vary enough across the various levels of the lifestyle dimension to be significantly different from what we would expect by chance? We also include the bivariate correlation coefficient (Pearson's *r*) to show the strength of the linear association between the overweight and each lifestyle habits variables. In this paper we do not present the results of multivariate analyses for the data combined across years; multivariate analyses are contained in a separate manuscript under review at the time of this writing (Delva, Johnston, & O'Malley, 2005).

Eighth graders. As shown in Table 35, there is a significant inverse association between being overweight and the frequency with which 8th grade males and females *eat breakfast*; in general, higher frequency of eating breakfast is associated with less occurrence of overweight. A significant association occurs for all six gender-by-race groups, as well as for both males and females of low SES. The association is stronger among males, in particular, with the percent of overweight youth who indicated they never eat breakfast roughly twice as high as the percent of overweight youth who eat breakfast every day for all ethnic groups. A somewhat smaller difference in the percent of overweight youth who never eat breakfast regularly versus those who do so every day is observed among females. A smaller correlation coefficient is observed among females.

Significant differences in the percent of youth who are overweight by the frequency with which they *eat vegetables and fruits* are observed among White, Black, and Hispanic females, but only among White males. The relationship between the frequency with which youth eat vegetables and fruits among Black and Hispanic females appears to be irregular. The correlation coefficient between overweight and each, eating fruits and eating vegetables, is smaller than those observed between eating breakfast and overweight.

The prevalence of overweight also differs according to the frequency with which youth *exercise vigorously*. The greatest percent of overweight is found among those who sometimes, seldom, or never exercise vigorously, and this is true for both males and females. The negative correlation coefficients between overweight and frequency of vigorous exercise are all greater than 0.10, the exception being Black males where the association does not appear to be linear.

There is a generally ordinal relationship between the frequency with which youth get at least *seven hours of sleep* and being overweight among White males and White and Black females, though the correlations are of a small magnitude. In all groups, those reporting that they never get seven hours of sleep have the highest rate of overweight.

Increased hours spent *watching television* during the week and weekend is associated with a greater percent of overweight White and Hispanic males and females. Interestingly, there does not appear to be any association among either Black males or females between hours spent viewing television and percent being overweight. (This is true at 10th grade, as well.) There also is no association between TV viewing on weekends and overweight among Hispanic males.

Tenth graders. As Table 36 shows, there is a generally ordinal relationship between being overweight and the frequency with which 10th-grade males of all three racial/ethnic backgrounds *eat breakfast*. A significant similar association is found among White females; but the association does not reach statistical significance among Black and Hispanic females, and the magnitude of the inverse linear association between overweight and frequency of eating breakfast is smaller among females.

At 10th grade, significant differences in the percent of overweight youth by frequency of *eating vegetables and fruits* are observed primarily among White males and females, though the strength of the linear associations is of a very small magnitude.

There is an inverse association between *frequency of exercising vigorously* and percent overweight for White and Black males. The finding also is observed among White, Black, and Hispanic females.

There is a generally ordinal, negative relationship between the frequency with which youth get at least *seven hours of sleep* and being overweight among White and Hispanic males and females, though the association is stronger for Hispanics. For Black 10th graders the picture is less clear, in contrast to the slightly larger inverse ordinal association they show in 8th grade.

Finally, number of hours spent *watching television* during the week and weekend is associated with a greater percent of overweight White youth and Hispanic females. As in 8th grade, there is a positive association for low-SES females between television viewing on weekdays and weekends with percent overweight. The association is weaker for males.

Table 35. Percent Overweight (BMI percentile ≥ 85%) by Lifestyle Habits, Gender, Racial/Ethnic Backgrounds, and SES for 8th Graders: 1993–2003 Aggregated Data

Grade 8

Frequency of Behavior	Total	Males				Females			
		White	Black	Hispanic	Low SES	White	Black	Hispanic	Low SES
Breakfast									
(1) Never	31.1***	41.2***	47.7***	45.5***	43.9***	19.7***	36.2***	34.9**	31.4**
(2) Seldom	28.8	34.3	31.5	44.2	36.4	21.2	38.4	29.2	30.2
(3) Sometimes	27.2	33.0	32.2	38.0	39.1	18.5	34.1	25.6	29.3
(4) Most days	23.0	26.5	30.5	33.0	25.6	15.8	25.4	27.7	24.8
(5) Nearly every day	21.8	25.3	28.9	30.6	29.8	15.8	23.0	22.0	23.6
(6) Every day	18.9	20.6	21.7	26.2	25.7	12.9	27.0	22.2	21.6
Pearson's *r*	**-0.10**	**-0.14**	**-0.13**	**-0.15**	**-0.13**	**-0.08**	**-0.10**	**-0.09**	**-0.08**
Vegetables									
(1) Never	28.9***	30.5***	34.3	37.2	36.5	17.2**	30.5**	30.3	29.2
(2) Seldom	27.0	30.1	28.4	31.4	31.1	17.6	37.9	30.6	26.9
(3) Sometimes	25.4	27.0	28.6	34.7	32.7	18.8	32.9	27.4	29.2
(4) Most days	23.9	26.7	27.3	33.4	29.8	17.7	33.0	26.3	27.5
(5) Nearly every day	21.6	24.1	30.2	32.1	30.0	16.7	24.8	24.7	28.6
(6) Every day	21.3	24.2	27.8	34.0	30.0	14.9	31.4	22.2	23.9
Pearson's *r*	**-0.06**	**-0.05**	**-0.02**	**-0.01**	**-0.05**	**-0.03**	**-0.04**	**-0.06**	**-0.03**
Fruit									
(1) Never	30.3***	33.8***	37.7	45.9	39.5	17.0***	34.5*	21.5*	22.6
(2) Seldom	28.2	31.3	31.1	35.9	36.3	20.2	36.1	29.0	28.3
(3) Sometimes	26.5	29.0	29.0	38.5	31.4	18.2	34.0	32.9	29.4
(4) Most days	24.6	26.4	32.1	31.6	29.5	18.4	34.8	24.4	28.9
(5) Nearly every day	22.8	25.0	28.7	32.2	31.8	17.2	28.7	28.7	28.9
(6) Every day	21.2	23.8	26.3	33.1	30.5	14.5	28.0	23.6	23.4
Pearson's *r*	**-0.06**	**-0.06**	**-0.05**	**-0.05**	**-0.04**	**-0.04**	**-0.06**	**-0.04**	**-0.03**
Exercise									
(1) Never	33.6***	36.6***	32.1	36.9***	36.8***	26.7***	36.2***	33.7***	30.6***
(2) Seldom	33.4	40.3	30.4	40.3	40.9	25.6	35.5	34.3	32.3
(3) Sometimes	29.9	34.1	33.0	43.0	36.7	22.6	38.3	32.4	32.7
(4) Most days	24.1	28.5	28.9	37.8	38.5	17.7	28.4	25.4	25.2
(5) Nearly every day	21.9	24.5	29.7	29.9	30.6	16.0	29.9	25.0	27.1
(6) Every day	18.5	20.3	27.1	29.1	24.7	11.2	25.4	18.4	20.0
Pearson's *r*	**-0.12**	**-0.14**	**-0.04**	**-0.10**	**-0.12**	**-0.13**	**-0.09**	**-0.13**	**-0.11**
Sleeps 7 hours									
(1) Never	34.5***	34.9***	35.5	37.9	40.2*	28.6***	44.1***	36.2	40.4*
(2) Seldom	27.6	33.5	30.9	31.6	33.6	19.2	41.6	27.0	27.7
(3) Sometimes	27.6	30.7	30.1	41.0	36.0	21.0	34.7	29.1	29.5
(4) Most days	23.8	28.4	33.5	38.1	34.8	16.3	28.2	25.0	25.3
(5) Nearly every day	21.5	23.5	28.3	31.0	28.3	16.0	28.7	28.8	26.7
(6) Every day	22.5	24.2	26.4	32.0	29.7	15.2	31.0	25.7	26.9
Pearson's *r*	**-0.06**	**-0.07**	**-0.05**	**-0.05**	**-0.05**	**-0.06**	**-0.07**	**-0.03**	**-0.04**

(table continues)

Table 35. ***(continued)***

Frequency of Behavior	Total	Males				Females			
		White	Black	Hispanic	Low SES	White	Black	Hispanic	Low SES
TV viewing during the week (M-F) (hrs)									
None	16.9***	21.7***	30.9	19.2**	21.0	11.8***	29.2	14.9*	26.4*
2.5	17.2	21.4	31.6	35.7	33.6	11.3	27.8	19.4	21.9
5.0	18.8	21.7	30.2	35.4	29.5	13.8	27.8	20.5	24.7
10.0	21.8	25.8	27.4	27.0	30.7	16.0	32.1	24.3	24.2
15.0	25.3	29.1	26.8	30.9	35.2	19.0	32.4	27.3	30.0
20.0	27.3	29.0	29.3	39.0	33.8	20.7	30.9	29.2	26.6
25.0	29.9	30.4	29.9	35.8	31.7	24.3	32.6	30.0	30.3
Pearson's *r*	**0.10**	**0.07**	**0.01**	**0.04**	**0.01**	**0.10**	**0.02**	**0.08**	**0.04**
TV viewing on an average weekend (hrs)									
None	17.6***	21.3***	27.1	24.8	24.8	10.3***	26.7	18.6***	20.5**
0.5	19.7	22.1	28.7	33.6	24.3	13.6	33.9	22.6	23.1
1.5	20.5	24.3	25.6	34.9	33.9	13.5	35.0	25.6	25.3
3.5	20.8	23.5	27.7	31.4	31.6	15.0	30.3	22.0	23.8
5.5	24.5	27.1	30.7	32.2	35.6	18.4	32.5	24.7	29.8
7.5	27.2	29.4	29.4	33.8	32.2	20.9	33.2	29.6	29.3
9.5	30.0	31.2	30.0	36.5	32.4	24.7	30.2	34.0	31.2
Pearson's *r*	**0.09**	**0.07**	**0.03**	**0.03**	**0.02**	**0.10**	**-0.02**	**0.08**	**0.06**

Note. The chi-square statistic was used to test if differences in the proportion of overweight youth vary by the frequency of the behavior within each of the groups listed (columns). Percents are weighted and standard errors take into account in the complex sampling design.
*p < 0.05. **p < 0.01. ***p < 0.001.

Table 36. Percent Overweight (BMI percentile ≥ 85%) by Lifestyle Habits, Gender, Racial/Ethnic Backgrounds, and SES for 10th Graders: 1993–2003 Aggregated Data

Grade 10

Frequency of Behavior	Total	Males				Females			
		White	Black	Hispanic	Low SES	White	Black	Hispanic	Low SES
Breakfast									
(1) Never	29.9***	39.0***	43.7***	49.3***	40.1***	18.8***	36.3	27.4	24.3*
(2) Seldom	27.1	34.7	37.3	43.1	40.4	19.1	31.0	24.3	26.0
(3) Sometimes	23.8	26.8	33.7	32.1	29.7	16.9	29.8	25.9	25.5
(4) Most days	21.9	26.8	31.8	34.1	32.8	13.5	30.6	24.3	23.9
(5) Nearly every day	20.9	25.5	27.1	32.3	31.6	14.0	24.5	22.4	24.2
(6) Every day	18.2	21.0	26.2	28.6	29.9	10.3	26.0	19.6	18.1
Pearson's r	**-0.09**	**-0.13**	**-0.11**	**-0.13**	**-0.09**	**-0.09**	**-0.06**	**-0.05**	**-0.05**
Vegetables									
(1) Never	28.4***	33.6***	31.5	40.6	35.1	14.5**	34.4	24.0	23.6
(2) Seldom	24.5	27.6	30.8	35.2	35.2	16.3	30.3	24.9	23.4
(3) Sometimes	23.7	27.6	32.6	33.5	31.4	16.2	28.7	24.3	24.1
(4) Most days	23.3	27.7	32.8	33.8	32.8	16.4	29.0	23.6	26.2
(5) Nearly every day	22.0	25.2	35.3	35.6	35.9	15.3	33.4	25.6	26.3
(6) Every day	20.7	24.9	31.2	36.8	34.7	13.2	27.4	21.0	20.9
Pearson's r	**-0.04**	**-0.04**	**0.01**	**-0.01**	**0.01**	**-0.02**	**-0.01**	**-0.02**	**-0.003**
Fruit									
(1) Never	33.8***	37.4***	40.7	57.8*	43.8	14.2*	45.5	34.4	26.3
(2) Seldom	24.6	29.3	33.2	31.9	34.2	16.6	25.3	24.5	20.8
(3) Sometimes	24.4	29.2	31.8	33.2	32.8	16.5	28.8	24.0	24.1
(4) Most days	23.5	27.8	32.4	37.5	34.6	16.1	29.7	22.1	24.0
(5) Nearly every day	21.4	24.2	31.5	35.4	33.6	15.2	30.6	23.4	24.7
(6) Every day	21.5	24.3	33.1	34.6	32.4	13.9	32.6	25.0	26.1
Pearson's r	**-0.04**	**-0.06**	**-0.01**	**-0.02**	**-0.03**	**-0.02**	**0.02**	**-0.003**	**0.02**
Exercise									
(1) Never	30.3***	34.5***	36.9**	38.7	38.8***	21.6***	34.5***	29.2***	29.5***
(2) Seldom	29.2	34.1	41.3	37.4	36.3	23.0	34.1	29.0	28.2
(3) Sometimes	26.5	32.9	37.8	38.6	41.8	19.5	32.5	28.6	25.3
(4) Most days	23.2	28.3	35.3	34.7	34.4	15.5	29.2	24.5	25.3
(5) Nearly every day	20.0	25.7	32.7	33.9	26.2	11.1	24.1	17.1	17.0
(6) Every day	18.9	21.6	27.2	34.5	31.5	9.6	23.5	18.4	19.8
Pearson's r	**-0.09**	**-0.11**	**-0.10**	**-0.03**	**-0.08**	**-0.13**	**-0.09**	**-0.11**	**-0.09**
Sleeps 7 hours									
(1) Never	31.9***	37.9***	39.1	48.6*	39.5	21.4***	32.9	31.2**	30.9
(2) Seldom	26.0	31.2	30.2	41.0	38.6	18.9	33.6	32.2	27.4
(3) Sometimes	22.8	26.2	33.8	40.1	34.2	16.3	29.8	24.6	23.7
(4) Most days	21.7	27.6	33.1	32.2	31.2	14.1	26.3	19.9	22.4
(5) Nearly every day	21.3	25.5	32.1	35.6	33.9	13.3	29.5	19.2	23.1
(6) Every day	23.0	24.8	31.9	31.6	32.3	14.7	31.0	23.0	23.4
Pearson's r	**-0.03**	**-0.05**	**-0.02**	**-0.09**	**-0.05**	**-0.05**	**-0.01**	**-0.07**	**-0.04**

(table continues)

Table 36. ***(continued)***

Frequency of Behavior	Total	Males				Females			
		White	Black	Hispanic	Low SES	White	Black	Hispanic	Low SES
TV viewing during the week (M-F) (hrs)									
None	14.7***	19.6***	39.7	40.7*	38.4	8.7***	24.9	21.9*	11.5**
2.5	16.2	21.4	26.7	34.5	33.0	11.0	32.4	18.0	20.1
5.0	19.1	23.7	28.7	34.6	32.3	13.1	27.7	21.1	20.8
10.0	22.6	26.0	34.6	36.3	35.5	15.9	30.3	23.4	23.9
15.0	25.9	29.5	31.3	33.6	32.3	19.0	31.8	23.6	25.3
20.0	28.4	31.5	34.1	35.9	34.3	21.0	28.1	29.1	25.6
25.0	32.3	36.1	33.3	44.7	38.7	23.1	30.8	31.2	28.6
Pearson's r	**0.12**	**0.10**	**0.01**	**0.06**	**0.03**	**0.11**	**0.01**	**0.09**	**0.08**
TV viewing on an average weekend (hrs)									
None	18.8***	24.3***	34.0	40.2*	30.6	10.8***	33.0	23.9	17.2***
0.5	17.0	23.0	29.7	33.2	34.0	10.6	23.0	18.2	18.5
1.5	18.8	23.4	27.3	35.3	32.0	12.0	28.8	23.3	21.3
3.5	22.4	25.4	30.7	40.0	33.1	15.4	33.0	24.6	25.1
5.5	24.6	28.2	29.3	33.1	34.6	18.4	27.4	24.8	24.8
7.5	27.6	30.1	35.9	33.7	36.6	20.4	29.6	27.8	25.6
9.5	32.6	34.7	37.4	42.6	39.1	24.3	32.2	29.2	30.3
Pearson's r	**0.11**	**0.08**	**0.07**	**0.02**	**0.05**	**0.11**	**0.02**	**0.06**	**0.08**

Note. The chi-square statistic was used to test if differences in the proportion of overweight youth vary by the frequency of the behavior within each of the groups listed (columns). Percents are weighted and standard errors taken into account in the complex sampling design.
*p < 0.05. **p < 0.01. ***p < 0.001.

SUMMARY AND CONCLUSIONS

This study's findings suggest that becoming overweight may be due in part to differences in eating patterns, exercise frequency, and television viewing. These findings are consistent with those of other studies (Boynton-Jarrett et al., 2003; Crespo et al., 2001; Lowery, Wechsler, Galuska, Fulton, & Kann, 2002; Story & French, 2004; Weber Cullen & Zakeri, 2004). The findings that Black and Hispanic youth are generally less likely than White youth to eat breakfast, fruits, and vegetables and to frequently exercise vigorously, and are more likely to spend time watching television, might be explained largely by associated SES differences. Indeed, *some but not all* differences are accounted by SES.

In general, the picture that emerges from the relationship between SES and race/ethnicity on these behaviors and percent overweight is complex and varies substantially according to the youth's gender and grade. For example, *nearly all* racial/ethnic differences in mean BMI and percent overweight among males in 8th and 10th grades remain after adjusting for SES. Among females in 8th and 10th grades, after adjusting for SES, *all but one* racial/ethnic difference in mean BMI, and in percent overweight, remain. By the time youth are in 12th grade, racial/ethnic differences in BMI among males are few and in the most recent years (2001–2003) are nonsignificant, with and without statistical adjustment for SES. On the other hand, the mean BMI and percent overweight of Black and Hispanic females in 12th grade have been significantly higher than that of White females even after adjusting for SES, though in the most recent years the differences between Hispanic and White females are no longer significant once SES is accounted for.

Racial/ethnic differences in the percent of youth who eat breakfast, fruits, and vegetables regularly remain fairly strong even after SES is entered in the model. These findings are observed mainly at the lower grades (8th and 10th graders) and among some 12th graders. Similarly, racial/ethnic differences in the percent of youth who exercise remain after SES is entered in the model, but this is observed primarily among females and not males. Finally, racial/ethnic differences in the mean number of hours of television viewing remain consistently large, even after SES differences are accounted for. Altogether, these findings indicate that SES differences do not fully explain the differences observed between racial/ethnic groups. However, it should be noted that the measure of SES is rather crude; only three categories, based only on parental education, are distinguished.

Study Limitations

Before we discuss the study's findings further, the following limitations should be considered. First, we do not have data on other potential predictors of overweight and obesity, such as detailed caloric intake and the family's eating and physical activity routines; nor do we have information on environmental factors that might influence students' behaviors, such as the widespread availability of junk foods and the reduction in physical education classes in schools across the nation. With funding from the Robert Wood Johnson Foundation, we recently began collecting school-level data that should help us monitor and understand the effects of school policies regarding nutrition and physical activity on youth obesity.

Second, the potential effects that school dropouts may have on the findings cannot be obtained, because school dropouts are omitted. We believe, however, that this is a minimal problem at 8th grade and only a modest one at 10th, because so few students have left school at those early points.

Third, the data are based on self-report. Prior research has found that adolescents tend to underreport their weight by an average of 3.5 pounds and overreport their height by an average of 2.7 inches, leading to an underestimation of BMI when using self-reports (Brener, McManus, Galuska, Lowry, & Wechsler, 2003). Although several studies also have concluded that the bias towards underreporting weight is sufficiently small to reach reliable conclusions (Brener et al., 2003; Goodman, Hinden, & Khandelwal, 2000; Strauss, 1999), it is still possible that the proportions of youth who are overweight are slightly underestimated in this study.

However, we do not think this potential downward bias had a substantial effect on the associations we report between overweight and lifestyle habits (Tables 35 and 36). In a study of the validity of self-reported BMI, Strauss (1999) found that "the use of self-reported weight and height resulted in the correct classification of obesity status in 94% of the children" (p. 906). These findings were similar for boys and girls and for all racial/ethnic groups included in that study (namely, White, Black, and Hispanic youth). Strauss (1999) observed that most bias in reporting seems to occur among obese youth who tend to underestimate their weight. It follows that the odds ratios between obesity and obesity-related variables were nearly identical whether obesity was calculated using self-reported or actual measurements of height and weight. Therefore, in the present study, if these biases are present, we believe they are relatively constant across groups. Nonetheless, further research is certainly needed to understand the magnitude and distribution of bias in self-reported height and weight for boys and girls according to their racial/ethnic backgrounds and socioeconomic status, among other variables.

Notwithstanding these limitations, this study provides substantial information on the distribution and trends of overweight by racial/ethnic background, socioeconomic levels, population density, and region using large national representative samples of youth.

Disease Burden and Health Disparities

The overrepresentation of overweight youth of racial/ethnic minority backgrounds and of low SES observed in this and other studies (Hoelscher et al., 2004; Nelson, Chiasson, & Ford, 2004; Wang, 2001) mimics the excess morbidity and mortality of a large number of health conditions and chronic diseases found among these population groups (Adler & Ostrove, 1999; Amaro & Raj, 2000; Breeze, Sloggett, & Fletcher, 1999; House et al., 1990; Institute of Medicine, 2002; McDonough, Williams, House, & Duncan, 1999; Sloggett & Joshi, 1994; Steenland, Hu, & Walker, 2004; U.S. Department of Health and Human Services, 2000; Williams, Yu, Jackson, & Anderson, 1997; Winkleby, Kraemer, Ahn, & Varady, 1998). However, as is the case with current attempts to understand racial/ethnic and SES differences in morbidity and mortality (Bartman, Moy, & D'Angelo, 1997; Folton, 1995; Newacheck & Starfield, 1988; Simpson, Bloom, Cohen, & Parsons, 1997; Kington & Smith, 1997; Krieger & Sidney, 1996; Sherman, 1994; Williams, 1990; Williams, Lavizzo-Mourey, & Warren, 1994; Williams, Neighbors, & Jackson, 2003), the recent progress made towards understanding overweight and obesity reveals no definitive answers. But, it provides some direction on the

underlying mechanisms that might be targets of interventions aimed at preventing or reducing overweight and obesity (Weber Cullen, Baranowski, Rittenberry, & Olvera, 2000; Geronimus, Bound, Waidmann, Hillemeier, & Burns, 1996; Grunbaum et al., 2002; Haas et al., 2003; Liao et al., 1998; Morland, Wing, Roux-Diez, & Poole, 2001; Serdula et al., 2004; Story et al., 2002; Troiano & Flegal, 1998; U.S. General Accounting Office, 2004).

Implications for Prevention

The recently released WHO report entitled "Diet, Nutrition, and the Prevention of Chronic Diseases" (WHO, 2003) provides a number of strategic directions and recommendations for policy and research to prevent and reduce the prevalence and incidence of obesity and its associated chronic diseases. Some of the stated policy principles include the following:

- "Strategies should be *comprehensive* and address all major dietary and physical activity risks for chronic diseases together, alongside other risks—such as tobacco use—from a multisectoral perspective." (p. 135)
- "A *life-course perspective* on chronic disease prevention and control is critical. This starts with maternal and child health, nutrition and care practices, and carries through to school and workplace environments, access to preventive health and primary care…" (p. 135)
- "Strategies should explicitly address equality and diminish disparities; they should focus on the needs of the *poorest communities and population group*" (p. 135)

Building on the above principles, the WHO (2003) report lists several recommendations for creating supportive environments that will encourage and support a healthy lifestyle and better individual choices. Some of the actions that will lead to better environments include "increasing access—especially of low-income communities—to a supply of nutrient-dense fresh foods; regulations that support this, facilitating access to high-quality diets through pricing policies; nutrition labels to inform consumers, in particular about the appropriate use of health/nutrition claims" (p. 139). One of the key strategies mentioned in the report is for the development of "a surveillance system for monitoring diet, physical activity and related health problems" in order to "track progress towards each country's diet-related health targets, and to guide the choice, intensity and timing of measures to accelerate achievement. The data required for implementing effective policies need to be specific for age, sex and social group, and indicate changing trends over time" (p. 142).

Consistent with the WHO guidelines and suggested strategies, as well as of those recently published by the Institute of Medicine (2005), a current initiative funded by the Robert Wood Johnson Foundation (RWJF), Bridging the Gap (BTG), seeks to measure and monitor school-level policies and programs related to nutritional content of the foods and beverages offered to students. The Youth, Education, and Society (YES) study, of which the present research is a component, is one of two major elements of the larger BTG initiative. The YES team, in collaboration with BTG colleagues at the University of Illinois at Chicago, and the Monitoring the Future (MTF) project, are collecting individual-, school-, and community-level data to track trends and answer questions about the types of individual and contextual factors associated with

overweight and obesity, and to identify effective solutions to these serious health problems among our youth. The emphasis is on evaluating the relative importance of various policies, practices, and conditions in the school and community environments; tracking changes over time in those policies, practices, and conditions; and assessing whether student rates of overweight change in response to such environmental changes. Past and future publications from this initiative may be found on the Web sites of the two component studies that comprise BTG—*www.yesresearch.org* and *www.ImpacTeen.org.*

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