Race/Ethnicity, Life-Course Socioeconomic Position, and Body Weight Trajectories Over 34 years: The Alameda County Study

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Objectives. We investigated whether race differences in weight gain over 34 years were because of socioeconomic position (SEP) and psychosocial and behavioral factors (physical activity, cigarette smoking, alcohol consumption, depression, marital status, number of children). We used a life-course approach to SEP with 4 measures of SEP (childhood SEP, education, occupation, income) and a cumulative measure of SEP.

Methods. We used mixed models and data collected from the Alameda County Study to examine the association between race and weight change slopes and baseline weight in men (n = 1186) and women (n = 1375) aged 17 to 40 years at baseline (in 1965).

Results. All subjects gained weight over time. African American women weighed 4.96 kg ($P < .001$) more at baseline and gained 0.10 kg/year ($P = .043$) more weight than White women. Black men weighed 2.41 kg ($P = .006$) more at baseline but did not gain more weight than White men. The association of race with weight gain in women was largely because of cumulative SEP score.

Conclusions. Interventions to prevent overweight and obesity should begin early in life and target the socioeconomically disadvantaged. (*Am J Public Health.* 2005;95:1595–1601. doi:10.2105/AJPH.2004.046292)

Rates of obesity and overweight in the United States have continued to rise over several decades.[1–3] Although all racial and ethnic groups are experiencing this trend, obesity is more common in Black than in White Americans, with this difference being particularly large among women.[4] Several longitudinal studies have found African Americans to be at greater risk of adult weight gain than Whites, with the racial/ethnic differences being stronger and more consistent in women.[5–8]

Lower socioeconomic position (SEP) has been shown to be associated with obesity.[9] Because Blacks are more likely to experience lower SEP than Whites, it is plausible that observed racial differences in body weight might be because of socioeconomic disadvantage. Studies investigating the role of SEP in explaining racial differences in weight gain have included adjustments for 1 or at most 2 measures of SEP.[6,7] In these studies, the racial difference in weight gain was attenuated but not eliminated.

We examined racial/ethnic differences in weight gain by measuring body weight in a community sample over a 34-year period, a period that covered most of the adult lives of many of the participants. Studies have shown that long-term weight gain in adulthood is associated with a greater risk of coronary heart disease,[10] breast cancer,[11] and insulin resistance syndrome.[12] Most of the previous prospective studies of racial/ethnic differences in weight gain were conducted over much shorter periods of time (5 to 10 years).[6–8]

We took a life-course perspective when examining SEP as a mediator of racial differences in weight gain. Such a perspective recognizes that socioeconomic exposures during the life course may independently contribute to weight gain, or exposures may be linked to each other and accumulate over time.[13,14] To our knowledge, this study of racial/ethnic differences in body weight is among the first to take such a life-course approach and to include multiple measures of SEP (childhood SEP, education, occupation, and income). We explored the measures of SEP separately and then used them to create and investigate a measure of cumulative socioeconomic disadvantage.

Psychosocial factors and behavioral factors independent of SEP also may explain the racial difference in body weight, but little research has examined such factors as mediators of racial/ethnic differences in body weight. We also examined the roles of marital status, the number of children in the household, physical activity, smoking, alcohol consumption, and depression as possible mediators of racial differences in weight gain.

We hypothesized that Blacks would have a greater rate of weight gain than Whites. We also hypothesized that the racial differences would largely be because of SEP, especially as measured by cumulative SEP. Finally we hypothesized that any remaining racial difference in weight gain would be explained by psychosocial and behavioral variables.

METHODS

Study Population

The Alameda County Study in Alameda County, California, is a longitudinal, population-based cohort study of 6928 adults (86% of eligible persons) derived from a stratified, random household sample.[15-17] The study began in 1965, when all adults aged 18 years or older (17 years if married) in a household were eligible for inclusion in the study and were administered questionnaires. Follow-up questionnaires were administered by mail in 1974, 1983, 1994, and 1999. Participants were asked to respond to questions about their mental and physical health, SEP, and social relationships. The sample sizes in 1974, 1983 (50% sample), 1994, and 1999 were 4864 (85% of eligible), 1799 (87% of eligible), 2730 (93% of

eligible), and 2123 (95% of eligible), respectively. More details of the sampling process are reported elsewhere.[16]

Black and White participants aged 40 years and younger who were not missing baseline covariates (n=2840) were eligible for inclusion in the analyses. Older respondents were excluded to minimize problems of selective survival related to weight and to limit the population to one that was more likely to be gaining weight (weight loss is common in elderly persons[18]). Respondents reported belonging to several different racial and ethnic groups; however, there were only sufficient numbers of White and Black respondents to conduct a meaningful analysis. Respondents missing any values for the baseline covariates used in the statistical models (n=279; 9.8%) were excluded from all analyses. The study population was thus limited to the 2561 (90.2% of those eligible) with nonmissing data who reported Black (n=299; 11.7%) or White (n=2262; 88.3%) race. Those excluded from the analyses because of missing data were more likely to be female, Black, younger, shorter, heavier, and poorer and to have higher childhood SEP.

Outcome Measures

Weight was self-reported in pounds, which were converted to kilograms for the analyses. Differences in baseline weight and weight gain (kilograms per year) by race were examined.

Socioeconomic Variables

Childhood SEP. Childhood SEP was categorized according to the father's occupation. When occupation information was missing, the father's education was used. The father's occupation was available for 93.5% of the respondents. Low childhood SEP was assigned to respondents reporting a father with a blue-collar occupation or an education of high school or less. Participants with a high childhood SEP were those whose father had a white-collar occupation or had more than a high school degree.

Education. Years of education were originally reported as a continuous variable. For the purposes of these analyses, categories were created to correspond to levels of certification: less than high school (<12 years) or high school graduate or more (≥12 years).

Occupation. Self-reported occupation was classified (according to 1960 US Census guidelines) into 1 of 4 categories: white collar, blue collar, keeping house (women only), or student/unemployed/other.

Income. Household income was originally reported in intervals. Exact dollar income values were imputed using the 1965 Current Population Survey, a national representative sample of US households.[19] Income was imputed because 117 subjects (4.3%) did not report income, and analyses with missing information are subject to bias.[20] We used a set of covariates (age, gender, race, education, marital status, number of household members, and income interval) present in both the Alameda County Study and the Current Population Survey to impute an income value with a series of regression models, using the same process described by Raghunathan et al.[21] The continuous imputed income was then log transformed.

Cumulative SEP. A lifetime socioeconomic measure also was explored. The cumulative SEP score was created by assigning a score of 0 to 2 for each of the 4 SEP variables, with a score of 2 representing the highest level of disadvantage. More specifically the scores were assigned as follows: childhood SEP (father's occupation): white-collar occupation=0, skilled blue-collar occupation=1, and nonskilled blue-collar occupation=2; education: college graduate=0, high school graduate or some college=1, less than high school=2; occupation: white collar=0, blue collar=2; and income: top tertile=0, median tertile=1, and bottom tertile=2. Women who reported keeping house were given an occupation score according to their husbands' occupational status. Those reporting student/unemployed/other had their occupation score assigned according to the occupation they reported in 1974. A cumulative score could not be created for 45 (3.5%) men and 52 (3.4%) women who were students in 1965 but were missing occupation information in 1974. The scores for each SEP variable were then added together to create the cumulative SEP score, ranging from 0 (most privileged) to 8 (most disadvantaged).

Covariates

Several variables were explored as potential mediators between race and weight gain. All variables represent the status reported in response to the 1965 questionnaire. Marital status was categorized as married, never married, or separated/divorced/widowed. Number of children in the household was collapsed into categories of 0, 1 to 2, and 3 or more. The physical activity score was constructed from the reported frequency (often, sometimes, never) of 3 separate activities: (1) swimming or taking long walks, (2) active sports, and (3) doing physical exercise. Responses for each item were scored as follows: often=2 points, sometimes=1, never=0. The scores from each item were summed to create a continuous physical activity score that ranged from 0 (least active) to 6 (most active). These items and scale construction have been used in previous studies and shown to be related to all-cause mortality.[22] Smoking status was defined as current smoker, former smoker, or never smoker. Alcohol consumption of any type (liquor, wine, or beer) was divided into 3 categories; abstainers (0 drinks per day), light drinkers (men: between 0 to 2 drinks per day; women: between 0 to 1 drinks per day), and moderate to heavy drinkers (men: more than 2 drinks per day; women: more than 1 drink per day). Depression was defined as reporting 5 or more symptoms on the Human Population Laboratory Depression Scale, an 18-item depressive symptom inventory. The scale assesses mood disturbances, negative self-concept, loss of energy, problems with eating and sleeping, and psychomotor retardation or agitation. This depression measure has been used in other analyses and has demonstrated reliability and validity.[23–25]

Adjustment Variables

All models contained an adjustment for the respondent's age and height (in centimeters) at baseline. Baseline weight served as both an outcome measure and an adjustment variable in models examining weight gain.

Statistical Analysis

Models were estimated using PROC MIXED in SAS version 8.0 (SAS Institute Inc, Cary, NC). A linear individual growth regression model was used to determine the effect of exposures on both baseline weight and weight change slope. Random effects were

included for the intercept and time. The statistical model used was as follows:

$$1)\ W_{it} = \beta_{0i} + \beta_{1i}\, t + \varepsilon_{it}$$
$$2)\ \beta_{0i} = \alpha_0 + \alpha_1 R + \alpha_2 x_1 + \ldots + \alpha_p x_p + \eta_{0i}$$
$$3)\ \beta_{1i} = \gamma_0 + \gamma_1 R + \gamma_2 x_1 + \ldots + \gamma_p x_p + \eta_{1i}$$

where W_t is body weight in kilograms at time t, β_{0i} is the term for baseline weight, β_{1i} is the term for change in body weight from baseline until time t. R is the race variable and x_{1-p} are covariates; ε_{it}, η_{0i}, and η_{1i} are error terms; α's are coefficients corresponding to baseline weight; and γ's are coefficients corresponding to weight change per year.

All variables, including adjustment and mediating variables, were thus included in each model as a main-effect term and as an interaction-with-time term. Linearity of the weight data was checked by visually comparing a plot of the line generated by the model to the average weight of subjects at each wave of data collection. All analyses were done separately for men and women.

Both weight outcome measures were derived from the models. Differences in baseline weight were obtained from the main-effect term of the race variable in the model. Weight gain differences were obtained from the interaction term for the race variable with time. All respondents with baseline weight data contributed to the intercept terms, whereas respondents with at least 2 data points contributed to slope terms.

The first model examined the effect of race, with adjustment for only age and height. We then examined the effect of SEP on race, with a series of models containing separate adjustments for each of the SEP variables. A model that contained simultaneous adjustment for all SEP terms was then estimated. The last model in the SEP analyses contained an adjustment for the cumulative SEP measure. The effects of the mediating variables on the observed racial differences were then examined separately and in conceptually relevant combinations in a series of models that also adjusted for cumulative SEP, height, and age. The combinations of variables were as follows: a family factors model included marital status and number of children; a behavioral model included physical activity, smoking, and alcohol consumption; and another model contained all mediating variables.

RESULTS

The distribution of the variables for Black and White men and women in the study population is shown in Table 1. For each measure of SEP, Blacks were found to be more disadvantaged than Whites. The cumulative disadvantage score was also higher in Blacks (men=5.00, women=4.82) than in Whites (men=3.20, women=3.19). Black men were more likely to be never married (24.0% vs 18.2%) or separated, widowed, or divorced (7.2% vs 3.4%) but otherwise did not differ from their White counterparts aside from the socioeconomic measures. Black women were heavier (63.17 vs 58.37 kg) and slightly but significantly older (30.78 years vs 29.42 years) than White women. They were also more likely to be separated, divorced, or widowed (25.3% vs 7.2%); have 3 or more children (41.4% vs 31.7%); be less physically active (score=2.17 vs 2.81); and abstain from alcohol (35.1% vs 16.0%).

Figure 1 shows the racial/ethnic difference in weight gain over time from models adjusted for height and age. Black women weighed almost 5 kg (4.96 kg; $P<.001$) more at baseline and gained weight at a greater rate (racial difference in weight gain=0.10 kg/year; $P=0.043$) than did White women. After 34 years this would amount to a weight gain of 13.26 kg for White women and 17 kg for Black women. When the difference at baseline and the differential gain are taken into account, Black women, after 34 years would be 8.70 kg heavier than White women. Black men weighed significantly more at baseline (2.41 kg; $P=.006$) but did not gain weight at a significantly greater rate than did White men (racial difference in weight gain= 0.02 kg/year; $P=.655$). Although among men the racial difference in weight gained was not significant, the potential amount gained by both races was substantial. Multiplying the White male gain rate of 0.28 kg/year by the 34-year duration of the study yields a cumulative gain of 9.52 kg, whereas the same process yields a total weight gain of 10.2 kg for Black men. On the basis of the baseline weight differences and the weight gain rates, both Black men and Black women spent more of their lives overweight than did White men and White women, with Black women approaching obesity by the end of the 34-year period.

Table 2 shows the racial differences in baseline weight and weight gain obtained from the SEP-adjusted models; positive numbers indicate greater weight or weight gain in Blacks than in Whites, whereas negative numbers indicate lower weight or weight gain in Blacks than in Whites. Separate adjustment of all SEP measures, except for income, led to an attenuation of the racial difference in baseline weight in men. The largest attenuation because of a single measure, from 2.41 to 2.07 kg, was because of adjustment for childhood SEP. Adjustment for the cumulative SEP measure caused a somewhat larger attenuation of the racial difference than simultaneous adjustment for the separate SEP measures. For women, adjustment for each of the separate SEP terms led to at least a small reduction of the racial difference for baseline weight. Of the separate measures, only income had a sizable (>10% attenuation) effect on the racial difference in baseline weight. Adjustment for the cumulative SEP measure led to a much greater reduction in the baseline weight racial difference than did simultaneous adjustment for all the separate SEP terms.

The effects of SEP adjustments for weight gain differences in men are not discussed because the racial difference was not statistically significant. A 30% reduction in the racial difference in weight gain in women was achieved by adjustment for childhood SEP. Simultaneous adjustments for the separate terms led to a bigger reduction in the racial difference in weight gain than did adjustment for the cumulative measure (Table 2).

Table 3 presents the effect of adjustment for risk factors on racial differences in baseline weight and weight gain (adjusted for cumulative SEP). Adjustment for other risk factors beyond cumulative SEP did not attenuate the racial difference in baseline weight appreciably for men or women.

Although the racial difference in weight gain was no longer statistically significant

TABLE 1—Distribution of Variables by Race of Participants Aged 40 Years and Younger in 1965 in the Alameda County Study: Alameda County, California [a]

	Men (n = 1186)		Women (n = 1375)	
	Black (n = 125)	White (n = 1061)	Black (n = 174)	White (n = 1201)
Mean age, y (SD)	29.78 (5.95)	30.09 (5.82)	30.78 (6.33)	29.42 (6.30)
Mean height, cm (SD)	178.51 (7.46)	178.78 (7.52)	163.48 (6.62)	163.72 (6.79)
Mean weight, kg (SD)	79.06 (10.71)	77.11 (10.78)	63.17 (12.20)	58.37 (10.12)
Childhood SEP, no. (%)				
Low	98 (78.40)	542 (51.08)	129 (74.14)	575 (47.88)
High	27 (21.60)	519 (48.92)	45 (25.86)	626 (52.12)
Education, no. (%)				
< High school	38 (30.40)	174 (16.40)	45 (25.86)	232 (19.32)
≥ High school	87 (69.60)	887 (83.60)	129 (74.14)	969 (80.68)
Occupation, no. (%)				
Blue collar	87 (69.60)	418 (39.40)	53 (30.46)	87 (7.24)
White collar	35 (28.00)	512 (48.26)	59 (33.91)	446 (37.14)
Unemployed/student/other	3 (2.40)	131 (12.35)	0 (0.00)	39 (3.25)
Keeping house	. . .	. . .	62 (35.63)	629 (52.37)
Mean household income, 1999 $ (SD)	43 915.84 (21 400.34)	53 291.64 (36 933.19)	38 834.44 (26 704.69)	53 995.22 (37 787.14)
Mean cumulative SEP disadvantage score (SD)	5.00 (1.88)	3.20 (2.03)	4.82 (1.70)	3.19 (1.92)
Marital status, no. (%)				
Married	86 (68.80)	832 (78.42)	115 (66.09)	968 (80.60)
Never married	30 (24.00)	193 (18.19)	15 (8.62)	146 (12.16)
Separated/divorced/widowed	9 (7.20)	36 (3.39)	44 (25.29)	87 (7.24)
Number of children				
0	39 (31.20)	394 (37.13)	34 (19.54)	359 (29.89)
1–2	50 (40.00)	383 (36.10)	68 (39.08)	461 (38.38)
≥3	36 (28.80)	284 (26.77)	72 (41.38)	381 (31.72)
Mean physical activity[b] (SD)	2.90 (1.63)	3.04 (1.53)	2.17 (1.50)	2.81 (1.43)
Smoking status, no. (%)				
Current	76 (60.80)	561 (52.87)	90 (51.72)	581 (48.38)
Former	16 (12.80)	176 (16.59)	15 (8.62)	163 (13.57)
Never	33 (26.40)	324 (30.54)	69 (39.66)	457 (38.05)
Alcohol consumption, no. (%)				
Abstain	15 (12.00)	100 (9.43)	61 (35.06)	192 (15.99)
Moderate	91 (72.80)	777 (73.23)	97 (55.75)	796 (66.28)
Heavy	19 (15.20)	184 (17.34)	16 (9.20)	213 (17.74)
Depression, no. (%)				
> 5 symptoms	17 (13.60)	106 (9.99)	32 (18.39)	177 (14.74)
< 5 symptoms	108 (86.40)	955 (90.01)	142 (81.61)	1024 (85.26)

Note. SEP = socioeconomic position.
[a]Mean and standard deviation are presented for continuous variables; number and percentage are presented for categorical variables.
[b]Mean physical activity scores range from 0 to 6.

after adjustment for cumulative SEP, adjustment for physical activity and alcohol consumption led to a further modest reduction (–16.7%) of the racial difference in weight gain in women. Further attenuation of the racial difference in weight gain among women was achieved when all risk factors were included in the model.

DISCUSSION

The Alameda County Study provided the unique opportunity to study body weight during most of adulthood. The results revealed that Blacks tended to be heavier throughout life than did Whites. The modest racial differences in weight for men and large racial differences in weight for women are in line with cross-sectional and shorter follow-up studies.[5–8,26] Our first hypothesis, that weight gain in adulthood would be greater in Blacks than in Whites, was supported in women only. However, this does not mean that conditions associated with higher body weight may not be a problem for Black men, because their

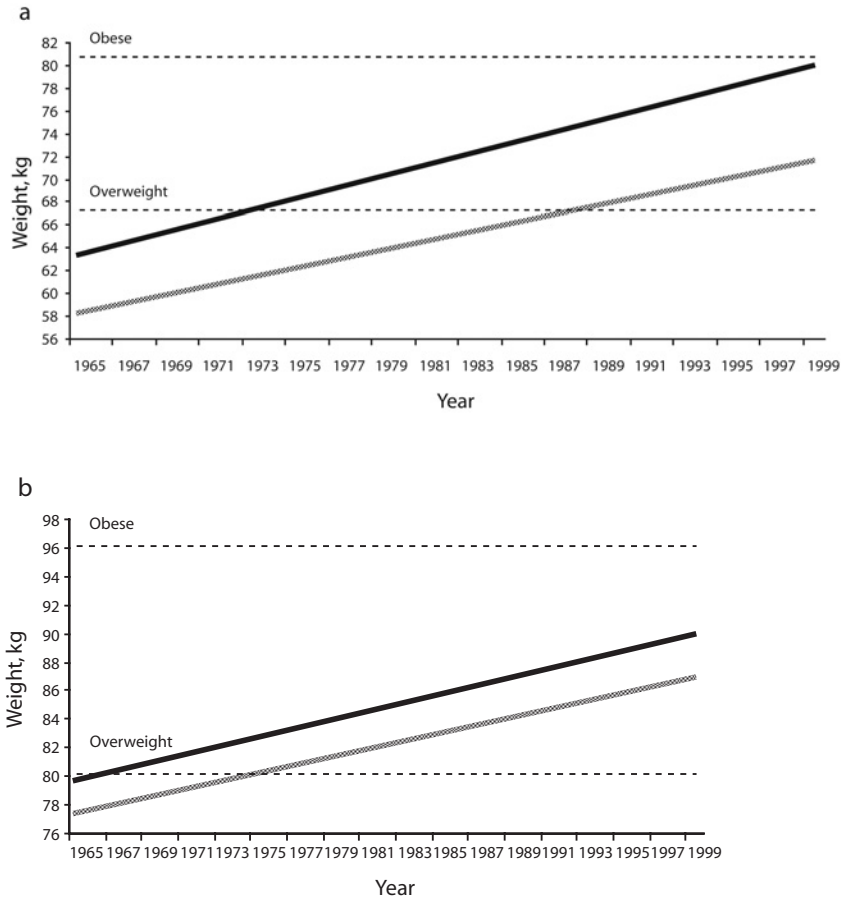

FIGURE 1—Body weight by year of study for Black (black line) and White (gray line) women (a) and men (b) aged 17 to 40 years in 1965 in the Alameda County Study with adjustment for age and height.

TABLE 2—Race Differences (Black vs White) in Baseline Weight and Weight Gain After Adjusting for SEP Measures.

	Men (n = 1186)		Women (n = 1375)	
Adjustment	Baseline, kg	Weight Gain, kg/y	Baseline, kg	Weight Gain, kg/y
No SEP adjustment	+2.41**	+0.02	+4.96***	+0.10*
Childhood SEP	+2.07**	+0.02	+4.65***	+0.07
Education	+2.32**	+0.01	+4.79***	+0.09
Occupation	+2.14*	−0.00	+4.89***	+0.08
Income	+2.47**	+0.02	+4.44***	+0.09
All SEP variables	+1.97*	−0.01	+4.34***	+0.05
Cumulative SEP	+1.93*	−0.01	+3.58***	+0.06

Note. SEP = socioeconomic position. Results were derived from mixed models (age and baseline height adjusted) of participants aged 40 years and younger in 1965 in the Alameda County Study.
*P < .05, **P < .01; ***P < .001.

higher weight at baseline was maintained throughout their lives. The results do suggest that Black women may be at the greatest weight-related health risk, because they spent most of the study period overweight and as a group approached obesity by the end of the study period.

The results show that a cumulative measure of SEP explains a large amount of the racial difference in weight gain in women, partially supporting our second hypothesis, that the racial differences would largely be because of SEP, especially as measured by cumulative SEP. Most previous studies[6,7] of racial differences in body weight or weight gain have been able to adjust for only 1 or 2 measures of SEP, leading to only a slight attenuation of the race and weight association. Because Blacks may face more socioeconomic adversity throughout their lives than Whites, it makes sense to adjust for some measure of cumulative disadvantage rather than a single measure such as education. The use of cumulative SEP or multiple measures of SEP is a promising line of research[27–29] and may help explain racial disparities in other health outcomes as well. The fact that the baseline weight racial difference in women was not greatly attenuated by adjustment for measures of SEP suggests that other factors not related to SEP may be driving racial differences in body weight during childhood, adolescence, and early adulthood.

Because SEP explained most of the racial difference in weight gain, it was not necessary to pursue our third hypothesis, that any remaining racial difference in weight gain would be explained by psychosocial and behavioral variables. However, there were large baseline racial differences that persisted after adjustment for SEP, and it is perhaps surprising that none of the other covariates, especially physical activity, explained this difference. It should be noted that the variables are self-reported and subject to bias, and that they were measured concurrently with weight in adulthood. The fact that childhood SEP was the socioeconomic measure that most greatly attenuated the baseline weight association in men and the weight gain association in women suggests that the roots of the racial difference may have begun sometime in childhood. It is also quite possible that other unmeasured

TABLE 3—Race Differences (Black vs White) in Baseline Weight and Weight Gain After Controlling for Potential Causal Factors

Adjustment	Men (n = 1186)		Women (n = 1375)	
	Baseline, kg	Weight Gain, kg/y	Baseline, kg	Weight Gain, kg/y
No adjustment for causal variables	+1.93*	–0.01	+3.58***	+0.06
Marital status	+2.01*	–0.01	+3.61***	+0.06
Children	+1.94*	–0.01	+3.57***	+0.06
Family: marital status + children	+1.97*	–0.01	+3.60***	+0.06
Physical activity	+1.93*	–0.01	+3.42***	+0.05
Smoking	+1.87*	+0.01	+3.46***	+0.06
Alcohol	+1.98*	–0.01	+3.53***	+0.05
Behavior: physical activity + smoking + alcohol	+1.89*	+0.01	+3.36***	+0.05
Depression	+1.96*	–0.01	+3.59***	+0.06
All variables	+1.95*	+0.01	+3.48***	+0.04

Note. SEP = socioeconomic position. Results derived from mixed models (age, baseline height, and cumulative SEP adjusted) of participants aged 40 years and younger in 1965 in the Alameda County Study.
*P < .05, **P < .01; ***P < .001

behavioral variables are responsible for the remaining racial difference. For instance, cultural differences in desired ideal weight and body image[30–32] may lead White girls and women to restrict caloric intake, whether with a healthy diet or an eating disorder, more than their Black counterparts.[33,34]

One limitation of the present study is the use of self-reported weight. Self-reported weight was been shown to be highly correlated with measured weight (r^2=0.99).[35,36] Unfortunately, studies have not explored whether the validity of self-reported weight varies by race.

Studies such as this that seek to determine if SEP explains racial differences in health have an inherent limitation. It is not possible to control perfectly for SEP when examining racial differences because measures of SEP are not equal in Blacks and Whites.[37] For instance, Blacks earn less money than their White counterparts with equivalent levels of education.[38] Blacks also have been shown to have to pay more for certain basic expenses including food, automobile insurance, and mortgages.[39,40] Higher prices mean lower purchasing power and consequently a lower standard of living for Blacks with incomes equivalent to those of Whites. Measures of SEP that somehow take into account these differences between Blacks and Whites need to be developed.

Selective survival and nonparticipation may have influenced the results to some degree, because Blacks were more likely to be lost to follow-up than were Whites. There are 2 reasons to believe that the estimated weight gain differences should not be greatly affected by the loss to follow-up. First, the maximum likelihood method for fitting the random effects model used in this study incorporates information from all observed data.[41] In essence, the models weight each respondent's data for his or her number of data points. The weighted average estimated for each racial group should reduce the problem of not having as many Black respondents participate until the end of the study. Second, the data suggest a nearly linear trend in weight gain for both Blacks and Whites. If weight gain slopes had attenuated greatly with age, it is possible that the racial differences observed would have been overinflated, because the average slope for Whites would have been reduced by the greater participation of Whites at older ages. To check if this might be happening despite the apparent linearity of the data, models were estimated excluding data from the later waves (1994 and 1999) when loss to follow-up was a bigger problem. These results did not appreciably change for men, and an even larger racial difference in weight gain was estimated for women, indicating that, if anything, the racial differences in weight gain reported in this paper may be biased toward the null.

Thus, overall the results suggest that racial differences in adult weight gain among women are largely because of life-course socioeconomic conditions. Interventions to prevent overweight and obesity and their concomitant health consequences need to start early in life. Further studies that use a life-course approach to examine the role of other factors, such as diet, in producing racial differences in body weight are sorely needed. ■

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This article was accepted December 8, 2004.

Contributors

P.T. Baltrus originated the study, performed the data analysis, and wrote the article. J.W. Lynch, S. Everson-Rose, and G.A. Kaplan provided advice in the design of the study and the writing of the article. T.E. Ragunathan provided advice in the choice of the statistical methods used and helped in the interpretation of the results.

Acknowledgments

This work was supported by the National Institute on Aging (grant AG-011375 to George A. Kaplan).

This study was part of P.T. Baltrus's doctoral dissertation at the University of Michigan.

Human Participant Protection

This study was approved by the institutional review board of the University of Michigan, Ann Arbor.

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