Lifecourse Socioeconomic Position and Weight Change among Blacks: The Pitt County Study

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Abstract

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Objective: The elevated prevalence of obesity among U.S. blacks has been attributed to low socioeconomic position (SEP), despite inconsistent empirical findings. It is unclear whether low SEP at various lifecourse stages differentially influences adulthood BMI and BMI change.

Research Methods and Procedures: Among 1167 black adults in the Pitt County Study, we examined independent cross-sectional and longitudinal associations between SEP, measured in childhood and adulthood, and BMI and 13-year BMI change. Low vs. high childhood SEP was measured by parental occupation and childhood household deprivation; low vs. high adulthood SEP was assessed by employment status, education, and occupation. Using childhood and adulthood SEP, four lifecourse SEP categories were created: low-low, low-high, high-low, high-high.

Results: We found no consistent associations between SEP and BMI or BMI change among men. Among women, we observed the expected inverse association between SEP and BMI at baseline. In multivariable-adjusted analyses, socioeconomically advantaged women demonstrated larger 13-year increases in BMI: skilled vs. unskilled parental occupation (6.1 vs. 4.8 kg/m^2, $p = 0.04$); college-educated vs. $<$ high school (6.2 vs. 4.5 kg/m^2, $p = 0.04$); white-collar vs. blue-collar job (5.8 vs. 4.8 kg/m^2, $p = 0.05$); and high-high vs. low-low lifecourse SEP (6.5 vs. 4.6 kg/m^2, $p = 0.02$).

Discussion: For women in this black cohort, lower SEP predicted earlier onset of obesity; however, low SEP was less predictive of BMI increases over time. Our findings demonstrate complex patterns of association between SEP and BMI change among black women.

Key words: blacks/African Americans, race/ethnicity, socioeconomic factors, BMI, weight gain

Introduction

More than 32% of the U.S. population is currently obese (1). The increasing prevalence of the condition has disproportionately affected blacks. Estimates suggest that more than 45% of the non-Hispanic black population is obese (compared with ~30% of non-Hispanic whites), and the highest prevalence is observed among black women (1). The increased risk for obesity among blacks, as in all other groups, is strongly influenced by obesity-related risk behaviors (i.e., high caloric intake and physical inactivity) and the energy imbalance that results (2). These modifiable risk behaviors are strongly patterned by socioeconomic position (SEP)[1] (3).

Although traditionally studied in a uni-dimensional fashion, SEP is comprised of multiple components reflecting a range of individual, household, and broader social contextual circumstances (4). These varied SEP indicators may differentially impact obesity risk at various points across the lifecourse (5). Indeed, both childhood and adulthood SEP are potent determinants of weight status and weight change among adult whites in developed countries (5,6). However, empirical evidence supporting the association among blacks has been much less consistent, particularly for black women (7–9).

A number of cross-sectional investigations have shown no protective effect of higher SEP (reflecting both childhood and adulthood periods) on adulthood obesity preva-

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[1] Nonstandard abbreviation: SEP, socioeconomic position.

lence among black women (7–10). Similarly, a recent comprehensive review found scant evidence of a consistent association between SEP and weight change among blacks (5). For example, in the Coronary Artery Risk Development in Young Adults study, Burke et al. (11) found an inverse association between adulthood educational attainment and weight gain after 5 years for black women, but not for black men. However, after 7 years of follow-up in the same cohort, Greenlund et al. (8) failed to find associations with weight gain for either adulthood educational attainment or parental education (a measure of childhood SEP). Relatively few investigations have adopted a lifecourse perspective in the study of SEP and weight change among blacks (12). To date, there has been little evidence linking childhood SEP with either adulthood weight status or weight change. Furthermore, we are unaware of any empirical evidence that upward socioeconomic mobility confers protection against the impact of adverse childhood socioeconomic circumstances on adulthood weight gain among blacks.

The present study was designed to determine whether SEP (reflecting childhood, adulthood, and lifecourse SEP) was associated with BMI change in a cohort of black adult men and women residing in the southeastern United States. Compared with previous longitudinal studies of SEP and weight change among blacks, major strengths of the present study include its extended follow-up period, multiple measures of SEP, and objectively measured BMI—all factors that have been previously identified as methodological strengths in the study of SEP and weight change (5).

Research Methods and Procedures

Study Participants

Data were collected in the 1988 baseline and 2001 follow-up interviews of participants in the Pitt County (NC) Study, a community-based, prospective investigation of risk factors for hypertension and related disorders among black men and women residing in eastern North Carolina (13). Participants were 25 to 50 years old at baseline; individuals residing in middle-class neighborhoods were over-sampled to increase variation in SEP. The baseline sample, the sampling strategy, and the content of the baseline household interview are described in detail elsewhere (13). This study satisfied all criteria for the ethical treatment of human participants and was approved by the Institutional Review Boards of the University of Michigan, Duke University, and the Harvard School of Public Health.

Of the 2225 race- and age-eligible individuals, 1773 persons (661 men and 1112 women; 80%) were interviewed in 1988. Data were collected again in 2001 from all participants believed to be alive, non-institutionalized, and residing within a 100-mile radius of Greenville, the county's principal city. Of the 1540 individuals (543 men and 997 women) meeting these criteria, 1221 (428 men and 793 women; 79%) were re-interviewed. Of these, 43 were excluded owing to significant discrepancies in birth year ($\geq$2 years) or height ($\geq$2 inches), when comparing 1988 and 2001 values. These exclusions resulted in 1178 individuals (418 men and 760 women; 77% of the 1540 targeted interviews).

Measurement of Body Composition

In 1988 and 2001, trained interviewers measured weight (in pounds) with a balance scale after study participants removed their shoes and heavy clothing. Height to the nearest inch was measured with a vertical ruler; these values were converted to their metric form, and BMI was computed as kg/m^2.

Selection of Socioeconomic Measures

Our selection of socioeconomic measures was guided by the notion that various dimensions of childhood socioeconomic position might affect adulthood weight gain, either independently or synergistically through their impact on adulthood socioeconomic standing. We posited that parental occupation, a variable likely less subject to recall bias than other individual social class measures (e.g., parental education, income), could determine childhood exposure to obesity-promoting resources and behaviors. We also examined childhood material household circumstances, which were also thought to influence exposure to obesity-promoting environments. One would expect these contextual features to be largely determined by parental social class. However, in this cohort, they may also act independently of parental occupation, because, during childhood, most study participants would have likely resided in racially segregated communities that were subject to Jim Crow-era policies. These policies may have constrained individuals of higher socioeconomic standing from affording access to more advantaged contextual circumstances. Finally, we considered measures of adulthood SEP (which have been associated with obesity and weight gain primarily among whites), as well as lifecourse socioeconomic mobility, which allows for more precision in identifying the temporal course of socioeconomic effects on adulthood weight change.

Measurement of Childhood SEP

Childhood SEP data were obtained using a computer-based Event History Calendar. This methodology enhances long-term recall of information by inquiring about more easily remembered events (e.g., where one lived, and with whom, at specific points in time) (14).

Participants provided a brief description of the main job held by their family's primary breadwinner (e.g., biological parent, grandparent, or other person) during their childhood years, defined as birth to age 13 years. Each job description was coded to fit one of nine categories of the 1990 Census Occupational Classification. Examples include: 1 = mana-

gerial/professional, 5 = precision production and crafts; 9 = farm laborer. These nine job categories were subsequently collapsed into two broad categories: skilled vs. unskilled/farm laborer, designated as high and low parental occupation, respectively. Parental occupation could not be determined for 45 women and 21 men because they either had missing data for the primary breadwinner or were the children of single mothers, who had never worked outside the home and, thus, were categorized as homemakers. Additional details are available elsewhere (15).

We also considered several other measures of childhood material household conditions. Participants reported the number of years during childhood (ages 0 to 13 years) that they had: 1) not enough food to eat, 2) received public assistance, 3) lacked electricity, and 4) lacked indoor plumbing. Because distributions were skewed, these variables were dichotomized as 0 vs. 1 or more years.

Measurement of Adulthood SEP

Education was measured at baseline in four levels: less than high school, high school, some college, and college graduate. Participants' occupation at baseline was coded based on 9 Hollingshead job prestige (16) scores. Examples include: 1 = farm laborer/menial service worker; 4 = skilled manual worker; 5 = clerical/sales worker; and 9 = higher executive/major professional. These prestige scores were subsequently collapsed into two broad occupational categories: blue-collar if Hollingshead scores were 1 to 4 and white-collar if Hollingshead scores were 5 to 9.

On the basis of prior study findings (13), we sought to minimize misclassification of respondents' socioeconomic standing by creating an index of adulthood SEP, based on four measures collected in 1988. We used education and occupation as described above. The third variable, employment status, had two levels: employed vs. not employed. The fourth variable also had two levels, homeowner: yes/no. Household income was not collected in 1988; hence, employment status and home ownership provided some indirect information on respondents' differential access to income and wealth.

Adulthood SEP index categories were produced as follows: education (less than high school = 0, high school graduate but less than college = 0.5, college graduate = 1.0); occupation (blue-collar = 0, white-collar = 1); currently employed (no = 0, yes = 1); and home owner (no = 0, yes = 1). Summing the discrete components resulted in scores ranging from 0 to 4. The resulting variable was categorized as low ($\leq$1), medium (2), or high ($\geq$3).

Measurement of Lifecourse Socioeconomic Mobility

Life course socioeconomic mobility was determined by combining information on childhood SEP, using parental occupation, and adulthood SEP, dichotomized as high (score $\geq$3.0) or low (score $<$3.0). Four non-overlapping lifecourse SEP categories were created: low childhood/low adulthood; low childhood/high adulthood; high childhood/low adulthood; and high childhood/high adulthood.

Statistical Analysis

Generalized linear models were used to estimate the associations between SEP variables and BMI change between 1988 and 2001. Age- and multivariable-adjusted least squares mean BMI and BMI change values are presented. Analyses were weighted to take into account the oversampling of middle class households in 1988 and nonresponse to both the 1988 and 2001 surveys. All analyses were performed using SAS software (version 8; SAS Institute, Inc., Cary, NC). Our analyses are limited to the 416 men and 751 women with BMI values in both 1988 and 2001. Potential confounders, measured in 1988, included the following: age (years); marital status (currently/formerly/never married); participation in strenuous physical activity (yes/no); and current cigarette smoker (yes/no). In analyses of childhood SEP indicators, we also adjusted analyses for the adult SEP index. In analyses of adult SEP indicators, we also adjusted for parental occupation. Lifecourse SEP included measures of both childhood and adult SEP, so additional covariates were not included. BMI was used as our primary outcome because it adjusts weight for height and has arguably greater clinical and public health significance than body weight alone.

Results

Women, on average, had higher BMI levels than men at baseline and saw greater increases in BMI over the 13-year follow-up period (Table 1). Men and women reported comparable levels of childhood socioeconomic deprivation. Most participants (82% men, 84% women) had parents who were employed in unskilled occupations. However, few participants reported receiving public assistance, spending time without electricity, or experiencing food scarcity for more than 1 year during childhood. A majority, however, reported living without indoor plumbing for at least 1 year (66% men, 61% women). Most participants were not employed in white-collar occupations (63% men, 76% women). Almost 1 in 5 participants (21% men, 18% women) held college degrees, and a substantial number graduated from high school (38% men, 40% women). A larger percentage of women than men (42% vs. 34%) scored low on the adult SEP index. Most participants (58% men, 63% women) were categorized in the low-low lifecourse socioeconomic mobility category.

Baseline BMI

As shown in Table 2, for men, age-adjusted mean baseline BMI was positively associated with receipt of public assistance (p = 0.01) in childhood. Among women, age-

Table 1. Prevalence of sociodemographic factors at baseline for men and women, Pitt County Study

	Men		Women	
	N	%	*N*	%
Childhood SEP				
Parental occupation				
Low/unskilled	323	82	592	84
Skilled	73	18	115	16
Missing	20		44	
Childhood household deprivation				
Public assistance				
No	353	87	657	90
≥1 year	51	13	73	10
Missing	12		21	
No plumbing				
No	138	34	293	39
≥1 year	272	66	455	61
Missing	6		3	
No electricity				
No	346	84	616	83
≥1 year	64	16	129	17
Missing	6		6	
Food scarcity				
No	380	92	678	91
≥1 year	32	8	68	9
Missing	4		5	
Adulthood SEP				
Adult SEP index				
Low	140	34	299	42
Medium	137	33	212	30
High	136	33	203	28
Missing	3		37	
Education				
<High school	132	32	228	30
High school	159	38	302	40
Vocational school	36	9	87	12
≥College graduate	89	21	134	18
Missing				
White-collar occupation				
No	261	63	573	76
Yes	155	37	178	24
Lifecourse SEP				
Low-low	229	58	442	63
Low-high	94	24	150	21
High-low	36	9	78	11
High-high	37	9	37	5
Missing	20		44	

Table 1. Continued

	Men		Women	
	N	%	*N*	%
Marital status				
Married	259	62	314	42
Unmarried	156	38	437	58
Smoking status				
Current	183	44	251	33
Never or past	233	56	499	67
Physical activity				
Participated in strenuous activity	243	58	270	36
No strenuous activity	173	42	477	64
BMI (kg/m^2), mean (SD)	26.5 (4.5)		29.4 (6.8)	
Change in BMI (kg/m^2) from 1988 to 2001, mean (SD)	2.9 (4.2)		4.6 (5.7)	
Age (years), mean (SD)	36 (7)		36 (7)	

SD, standard deviation.

adjusted mean baseline BMI was inversely associated with parental occupation ($p = 0.01$), the adult SEP index ($p = 0.004$), education ($p = 0.004$), white-collar occupation ($p = 0.0004$), and the lifecourse SEP index ($p = 0.01$) (Table 3).

BMI Change

In multivariable-adjusted analyses, childhood SEP was generally not associated with increases in BMI among men. Adult SEP was not associated with BMI change among men, nor was lifecourse SEP.

Among women, both parental occupation and lacking plumbing during childhood were associated with BMI change in multivariable-adjusted analyses. Women whose parents held skilled occupations had greater mean BMI increases than women whose parents held unskilled occupations (6.1 vs. 4.8 kg/m^2, $p = 0.04$) (Figure 1). Women who reported living at least 1 year without plumbing reported smaller mean BMI increases than women who reported never living without plumbing (4.6 vs. 5.7 kg/m^2, $p = 0.02$). Interestingly, the adulthood SEP index score was also positively associated with BMI change among women: high-SEP women had a 1.3-kg/m^2 greater mean increase in BMI than low-SEP women (5.5 vs. 4.2 kg/m^2, $p = 0.06$). Education and occupation, rather than employment status and home ownership, appeared most responsible for this association. Compared with women with less than a high school education, women with a college education experienced a greater mean increase in BMI (6.2 kg/m^2 vs.4.5 kg/m^2, $p = 0.04$) (Figure 2). Women employed in white-collar occupations had a significantly greater mean BMI increase than women in blue-collar jobs (5.8 vs. 4.8 kg/m^2, $p = 0.05$). Predictably, lifecourse socioeconomic mobility was also significantly positively associated ($p = 0.02$) with mean BMI change. Specifically, women with high SEP in both childhood and adulthood had a greater mean BMI increase (6.5 kg/m^2) than women with a low SEP in both childhood and adulthood (4.6 kg/m^2) (Figure 3).

Discussion

Our findings highlight the complex patterns of association between SEP and BMI change among blacks. As previously reported (7), we found higher baseline BMI levels among black women in the most socioeconomically disadvantaged circumstances, using several SEP indicators. In contrast, however, black women with higher levels of SEP demonstrated greater increases in BMI over the 13-year follow-up period. Consistent with national prevalence data (1), by 2001, there was a high prevalence of obesity among black women in the Pitt County Study cohort, irrespective of SEP. We found no consistent associations between SEP and BMI change among men.

Nearly 20 years ago, Kumanyika (17) argued that socioeconomic factors may be less proximately associated with obesity than socio-cultural, environmental, and, potentially, biological and genetic factors. Indeed, the available empirical evidence (although limited) supports this supposition. Findings from studies investigating associations between SEP and body weight among black adult women tend to be inconsistent (7,18). Similarly (although in contrast to our findings), prior studies investigating weight change out-

Table 2. Socioeconomic differences in baseline and change in BMI among men, Pitt County Study

	Age-adjusted mean (SE) BMI (kg/m^2)				Change (SE) in BMI			
	Baseline		Follow-up		Age-adjusted		Multivariable adjusted*	
	BMI	p†	BMI	p†	Δ	p†	Δ	p†
Childhood SEP								
Parental occupation		0.28		0.30		0.74		0.93
Low/unskilled	25.9 (0.3)		29.0 (0.4)		3.1 (0.3)		3.1 (0.3)	
Skilled	26.5 (0.6)		29.8 (0.7)		3.3 (0.5)		3.1 (0.5)	
Childhood household deprivation								
Public assistance		0.01		0.32		0.13		0.18
No	25.8 (0.3)		29.2 (0.4)		3.4 (0.2)		3.4 (0.2)	
≥1 year	27.6 (0.6)		30.1 (0.8)		2.5 (0.6)		2.6 (0.6)	
No plumbing		0.14		0.19		0.74		0.80
No	25.6 (0.4)		28.8 (0.5)		3.2 (0.4)		3.2 (0.4)	
≥1 year	26.3 (0.3)		29.6 (0.4)		3.3 (0.3)		3.3 (0.3)	
No electricity		0.49		0.33		0.51		0.54
No	26.0 (0.3)		29.2 (0.4)		3.2 (0.3)		3.2 (0.3)	
≥1 year	26.4 (0.6)		30.0 (0.8)		3.6 (0.6)		3.6 (0.6)	
Food scarcity		0.57		0.89		0.68		0.68
No	26.0 (0.2)		29.3 (0.3)		3.3 (0.2)		3.3 (0.2)	
≥1 year	26.5 (0.8)		29.5 (1.0)		3.0 (0.7)		3.0 (0.7)	
Adulthood SEP								
Adult SEP index		0.12		0.13		0.66		0.94
Low	26.2 (0.4)		29.3 (0.5)		3.1 (0.3)		3.1 (0.4)	
Medium	25.4 (0.4)		28.6 (0.6)		3.2 (0.4)		3.1 (0.4)	
High	26.5 (0.4)		30.1 (0.6)		3.5 (0.4)		3.2 (0.4)	
Education		0.64		0.10		0.07		0.19
<High school	26.3 (0.4)		29.3 (0.5)		3.0 (0.4)		3.2 (0.4)	
High school	25.9 (0.4)		29.1 (0.5)		3.2 (0.3)		2.8 (0.4)	
Vocational school	25.3(0.8)		27.7(1.0)		2.4 (0.7)		2.4 (0.7)	
≥College graduate	26.2(0.5)		30.5 (0.7)		4.2(0.4)		3.9 (0.5)	
White-collar occupation		0.26		0.21		0.53		0.63
No	25.9 (0.3)		29.1 (0.4)		3.2 (0.3)		3.1 (0.3)	
Yes	26.4 (0.4)		29.8 (0.5)		3.4 (0.3)		3.3 (0.4)	
Lifecourse SEP		0.31		0.27		0.53		0.81
Low-low	25.7 (0.3)		28.7 (0.4)		3.1 (0.3)		3.1 (0.3)	
Low-high	26.5 (0.5)		29.6 (0.6)		3.1 (0.4)		3.1 (0.4)	
High-low	26.4 (0.8)		30.0 (1.0)		2.6 (0.7)		2.6 (0.7)	
High-high	26.6 (0.8)		30.6 (1.0)		4.0 (0.7)		3.6 (0.7)	

SE, standard error.

* The three adult SEP measures are adjusted for age, marital status, cigarette smoking, strenuous physical activity, and parental occupation. The four childhood SEP measures are adjusted for age, marital status, cigarette smoking, strenuous physical activity, and adult SEP index. Lifecourse SEP is adjusted for age, marital status, cigarette smoking, and strenuous physical activity.

† p represents comparison of least squared mean BMI or BMI change between levels of SEP indicators.

Table 3. Socioeconomic differences in baseline and change in BMI among women, Pitt County Study

	Age-adjusted mean (SE) BMI (kg/m^2)				Change (SE) in BMI			
	Baseline		Follow-up		Age-adjusted		Multivariable adjusted*	
	BMI	*P*†	BMI	*p*†	Δ	*p*†	Δ	*p*†
Childhood SEP								
Parental occupation		0.01		0.82		0.01		0.04
Low/unskilled	29.6 (0.3)		34.3 (0.4)		4.8 (0.3)		4.8 (0.3)	
Skilled	27.8 (0.6)		34.1 (0.8)		6.3 (0.5)		6.1 (0.6)	
Childhood household deprivation								
Public assistance		0.22		0.96		0.17		0.20
No	29.3 (0.3)		34.1 (0.4)		4.9 (0.2)		4.8 (0.3)	
≥1 year	28.2 (0.9)		34.1 (1.1)		5.9 (0.7)		5.8 (0.7)	
No plumbing		0.09		0.77		0.01		0.02
No	28.6 (0.4)		34.3 (0.6)		5.7 (0.4)		5.7 (0.4)	
≥1 year	29.5 (0.3)		34.1 (0.4)		4.6 (0.3)		4.6 (0.3)	
No electricity		0.21		0.09		0.28		0.27
No	29.3 (0.3)		34.5 (0.4)		5.2 (0.3)		5.1 (0.3)	
≥1 year	28.4 (0.7)		32.9 (0.9)		4.5 (0.6)		4.5 (0.6)	
Food scarcity		0.55		0.55		0.85		0.97
No	29.2 (0.3)		34.2 (0.4)		5.0 (0.2)		5.0 (0.3)	
≥1 year	28.7 (0.8)		33.6 (1.1)		4.9 (0.7)		4.9 (0.7)	
Adulthood SEP								
Adult SEP index		0.004		0.63		0.04		0.06
Low	30.2 (0.4)		34.5 (0.6)		4.3 (0.4)		4.3 (0.4)	
Medium	28.9 (0.5)		34.0 (0.6)		5.1 (0.4)		5.3 (0.4)	
High	28.2 (0.5)		33.7 (0.6)		5.5 (0.4)		5.5 (0.4)	
Education		0.004		0.09		0.02		0.04
<High school	30.6 (0.5)		35.1 (0.6)		4.6 (0.4)		4.5 (0.4)	
High school	28.8 (0.4)		33.8 (0.5)		4.9 (0.3)		5.0 (0.4)	
Vocational school	28.3 (0.8)		32.4 (1.0)		4.1 (0.6)		4.3 (0.7)	
≥College graduate	28.2 (0.6)		34.4 (0.7)		6.2 (0.5)		6.2 (0.5)	
White-collar occupation		0.0004		0.19		0.04		0.05
No	29.7 (0.3)		34.4 (0.4)		4.7 (0.3)		4.8 (0.3)	
Yes	27.7 (0.5)		33.5 (0.6)		5.7 (0.4)		5.8 (0.4)	
Lifecourse SEP		0.01		0.88		0.02		0.02
Low-low	30.0 (0.4)		34.5 (0.5)		4.5 (0.3)		4.6 (0.3)	
Low-high	28.6 (0.5)		33.9 (0.7)		5.3 (0.5)		5.4 (0.5)	
High-low	28.1 (0.8)		34.3 (1.0)		6.2 (0.7)		6.3 (0.7)	
High-high	27.3 (1.0)		33.9 (1.3)		6.6 (0.9)		6.5 (0.9)	

SE, standard error.

* The three adult SEP measures are adjusted for age, marital status, cigarette smoking, strenuous physical activity, and parental occupation. The four childhood SEP measures are adjusted for age, marital status, cigarette smoking, strenuous physical activity, and adult SEP index. Lifecourse SEP is adjusted for age, marital status, cigarette smoking, and strenuous physical activity.

† *p* represents comparison of least squared mean BMI or BMI change between levels of SEP indicators.

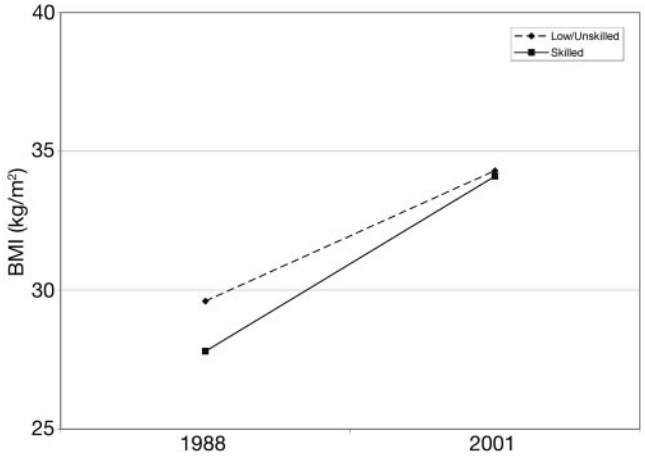

Figure 1: Parental occupation and BMI change in women, 1988–2001.

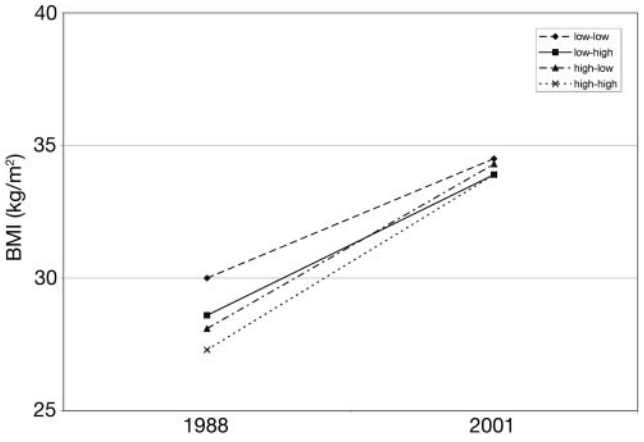

Figure 3: Lifecourse socioeconomic mobility and BMI change in women, 1988–2001.

comes among black women have either found support for an inverse association with SEP (9,11) or reported null results (8).

What might account for the somewhat counterintuitive finding of greater BMI change among black women of relatively higher SEP? In Pitt County, NC, as in other areas of the country, higher SEP connotes suburban residence, greater reliance on cars to conduct family (especially child-oriented) activities, and jobs that do not require significant energy expenditures (19,20). The greater BMI change among women with white-collar jobs may have resulted from the accumulation of these lifestyle factors.

Higher SEP women may also have greater exposure to a range of dietary options, including those that are obesity-promoting. It might seem logical to suspect that individuals of higher SEP would adopt fewer adverse obesity risk behaviors owing to their greater awareness of the condition's health ramifications. However, there is emerging evidence that blacks do not uniformly acknowledge the health consequences of obesity (21,22). We recently reported that blacks in the highest income category were the least likely to identify a connection between obesity and health (22). Other possible explanations for these findings, however, should be considered. Perhaps foremost among them is a potential ceiling effect for BMI change among those of lower SEP (Figures 1 to 3). Additionally, however, during the interval covered by our study's BMI change outcome, strong secular trends for weight gain were present in the general population (23). Although they undoubtedly affected weight gain trends among women during this period, our findings suggest that secular trends alone are insufficient to explain the additional BMI change observed among women with greater relative socioeconomic advantage.

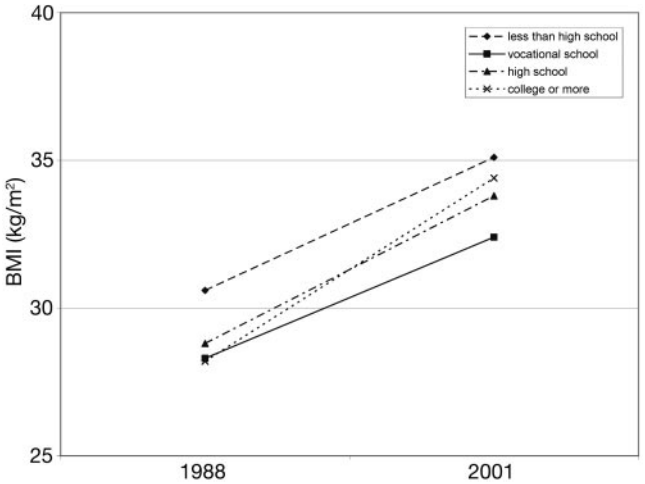

Figure 2: Adult educational attainment and BMI change in women, 1988–2001.

Our finding of an inverse relationship between childhood SEP and baseline adulthood BMI is consistent with several previous studies (12). However, we also found that higher childhood SEP was associated with greater BMI change, independently of adult SEP, and this finding stands in opposition to the bulk of research conducted largely among whites (12). We are aware of only one study (8) with significant black representation that has investigated the childhood SEP-weight change association. Greenlund et al. (8) found no associations with BMI change of either mother's or father's education among black men and women, over 7 years of follow-up. It has been argued that childhood SEP might impact adulthood weight by promoting dysregulation in the intrauterine environment or early life postnatal physiology (24) and/or by promoting the adoption of obesity risk behaviors across the lifecourse (3). The reasons for our counterintuitive weight gain finding for childhood SEP, however, remain unclear.

Our examination of several factors reflecting childhood household deprivation either yielded null results or, in the case of plumbing, produced results similar to those of the parental occupation variable. Our interpretation of these findings is challenged by our inability to identify other investigations that have used household variables in a similar manner. However, relatively few individuals reported receiving public assistance, food scarcity, or lacking electricity during childhood. Indoor plumbing, then, may have been the primary factor that discriminated individuals based on childhood contextual deprivation. Given the diffusion of technologies in the region during the time when study participants were children, it is also possible that the plumbing variable may serve as a proxy for geographic location or area of residence. Admittedly, our selection of household variables was not comprehensive; hence, it is possible that other variables reflecting the childhood household (e.g., number of children, type of residence) or neighborhood context (e.g., distance to full-service food stores, availability of exercise resources) might have yielded different associations with the BMI change outcome. Our household deprivation variables (as well as our parental occupation measure) may have also been susceptible to retrospective reporting bias; however, that bias is most likely to have been non-differential (in terms of respondent's status on the outcome variable), thus biasing the observed associations toward the null. Whereas studies of the association between dimensions of childhood SEP and obesity risk among whites are growing in number (12), few studies, to date, have been conducted among blacks. Given the large number of black children in adverse socioeconomic circumstances, both presently and historically, this is clearly an important area for future study.

Similarly, additional studies of the influence of socioeconomic mobility over the lifecourse and variation in the associated health risks are needed among U.S. blacks and other racial/ethnic minority groups. We found significantly higher BMI among those with low SEP both in childhood and in adulthood, in comparison to those with relatively advantaged circumstances at both time-points. However, by the 2001 follow-up, we found significantly greater BMI gain among individuals with relatively advantaged socioeconomic circumstances across the lifecourse. These findings are consistent with the overall pattern of our findings and suggest the diminishing importance of SEP and socioeconomic mobility for BMI change over the lifecourse. They also suggest periods during the lifecourse when clinical or community-based interventions to prevent obesity and obesity-related disorders (25), especially among black women, will be most propitious.

A number of considerations may limit the interpretations that can be drawn from our findings. Our parental occupation data are limited to those for the primary earner and did not account for variation in employment patterns. Our conservative approach to identifying individuals in the highest adulthood SEP category (which required possession of three of four major socioeconomic resources) likely minimized misclassification, but it also reduced statistical power for analyses involving this exposure. Five hundred ninety-eight participants were lost to follow-up in 2001; although these individuals had a lower mean BMI in 1988 compared with those who remained in the sample (27.6 vs. 28.4 kg/m^2, respectively, $p < 0.01$), we found no differences between the two groups on any of the studied socioeconomic measures. Loss to follow-up bias was minimized in the current study because we weighted the analyses for non-response to both the 1988 and 2001 surveys. Hence, these findings can be generalized to the entire 1988 cohort.

This study has several strengths. First, the weight change follow-up period of 13 years is the longest reported for black study participants. Second, we used multiple dimensions of SEP, reflecting both adulthood and childhood periods. Third, we used the Events History Calendar to enhance recall accuracy for all childhood variables. And, fourth, to our knowledge, this is the first study to investigate the impact of lifecourse socioeconomic mobility on objectively measured changes in BMI. Research testing the generality of these findings to African Americans in other geographic settings is strongly encouraged.

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