

## SHORT REPORT

# Childhood social class and adulthood obesity: findings from the Glasgow Alumni Cohort

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Associations between obesity and adverse health outcomes, including cardiorespiratory disease, diabetes, and cancer, are well documented.<sup>1</sup> These diseases are likely to pose ever increasing public health problems as the prevalence of obesity increases. The prevention of obesity requires an understanding of its determinants throughout the lifecourse.

A recent review concluded that childhood socioeconomic position is inversely related to adult obesity.<sup>2</sup> Most studies are cross sectional or rely on recalled data, or both, and longitudinal data on obesity development are sparse. Two cohorts with measures of weight in young and mid-adult life (1958 British birth cohorts and the Tecumseh community health study (CHS)) may not have adequately adjusted for adult socioeconomic position. To explore the relation between childhood socioeconomic position and weight in early and later adulthood, we analysed data from a cohort of university alumni, who display little heterogeneity in their adult socioeconomic position.

## PARTICIPANTS, METHODS, AND RESULTS

The Glasgow Alumni Cohort consists of 15 322 participants who were examined at the university health service between 1948 and 1968.<sup>3</sup> Height and weight were measured, and childhood social class was determined from the father's occupation. During 1948–50, 3180 students were examined. Between 1963 and 1966 about half of these were contacted and asked to report their current weight. Although few details of this survey remain, it is thought that these represent a random sample of people who attended the student health service. The response rate is not known, but is thought to be about 75% (J Durnin, personal communication). The social class distribution of the 1070 people for whom data are available is similar to that of the total population who attended the student health service in 1948–9. Body mass index (BMI) was computed from height and weight measurements. The 40 men

and 14 women with fathers in social class IV or V were analysed together with social class III. Social class I was used as the reference category for all analyses.

Mean age at examination and follow up was 22.8 and 38.9 years in men and 19.9 and 36.1 years in women. Those not included in the survey (including non-respondents) were slightly older (11 months) and less likely to be female (11% *v* 36%) than respondents. As the non-respondents include both people who were never contacted and those who were contacted and did not respond, it is incorrect to infer that the response rate differed between the sexes. The two groups did not differ in their height, weight, or social class distribution at baseline. Mean BMI, proportion overweight (BMI  $\geq$  25 kg/m<sup>2</sup>) and mean change in BMI over follow up are presented by social class (see table 1). Likelihood ratio tests based on linear and logistic regression models were used to calculate p values for trend across social class categories.

In early adulthood, no differences in mean BMI or in proportion overweight were seen across social classes I to III–V. In later adulthood, lower paternal social class was associated with higher mean BMI, though this did not reach conventional statistical significance in women. This could be attributable to the small numbers of women in this study. The proportion of people who were overweight at follow up was higher in low social classes in both sexes. Weight gain over the follow up period was greater among those from less affluent compared with more affluent backgrounds. Adjustment for smoking at baseline made little difference to the observed results. No data on smoking behaviour at follow up were available.

## COMMENT

Our analyses suggest that social origin is an important determinant of BMI in later, but not young, adult life. Less than 5% of adolescents leaving school at the time of the study went to university,<sup>4</sup> and those who did are likely to have consequently

**Table 1** Mean BMI and proportion overweight at each of two time points, and BMI change, by childhood social class

	Number (%)	Mean BMI (SE)*		Overweight†				Mean BMI change (SE)*
		Exam 1	Exam 2	Exam 1		Exam 2		
				N (%)	OR (95% CI)	N (%)	OR (95% CI)	
<b>Men</b>								
I	128 (19)	21.5 (0.16)	23.9 (0.22)	6 (5)	1.0	39 (30)	1.0	2.43 (0.17)
II	260 (38)	21.5 (0.09)	24.3 (0.12)	23 (9)	2.14 (0.81 to 5.65)	100 (38)	1.41 (0.90 to 2.22)	2.75 (0.09)
III–V	295 (43)	21.6 (0.12)	24.7 (0.16)	20 (7)	1.58 (0.59 to 4.21)	127 (43)	1.72 (1.10 to 2.68)	3.06 (0.12)
p (trend)‡		0.52	0.010		0.65		0.016	0.007
<b>Women</b>								
I	95 (24)	21.3 (0.21)	21.8 (0.22)	7 (7)	1.0	6 (6)	1.0	0.48 (0.22)
II	167 (43)	21.3 (0.12)	22.1 (0.13)	9 (5)	0.70 (0.25 to 1.96)	16 (10)	1.59 (0.60 to 4.23)	0.82 (0.13)
III–V	125 (32)	21.2 (0.19)	22.4 (0.20)	10 (8)	1.09 (0.40 to 2.97)	20 (16)	2.82 (1.09 to 7.34)	1.16 (0.20)
p (trend)‡		0.78	0.076		0.80		0.018	0.042

\*Adjusted for age at first examination. †BMI  $\geq$  25 kg/m<sup>2</sup>. ‡From regression analyses

enjoyed a comparatively high socioeconomic position during their adult life. These results suggest that social origins, rather than adult life socioeconomic position, may play an important part in the development of adult overweight and obesity. However, the lack of individual level data on adulthood socioeconomic position, as well as on important variables such as diet and exercise in adulthood limit, the strength of this study to determine the timing of important socioeconomic variables on adulthood BMI.

Of the four cohorts identified in Parson's review,<sup>2</sup> only the 1958 birth cohort and the Tecumseh CHS had repeated measures of weight. In the 1958 birth cohort, there was a greater odds of obesity at both 23 and 33 years in people with lower socioeconomic position. In the CHS, there was no statistically significant association between parental education and obesity in childhood, but an association was found at ages 15–19 and 20–39 years. These are at odds with our results, which are, however, compatible with those from a Scottish occupational cohort. That study suggested that adult socioeconomic position has less influence on adult BMI than does childhood socioeconomic position.<sup>5</sup>

We conclude that childhood social origins may have a long term impact on obesity. Whether this operates through the early establishment of behavioural patterns, such as diet and exercise, or through metabolic changes associated with early deprivation, is still to be determined. Further investigation of this issue, in cohorts with socioeconomic data in adulthood as well as behavioural data (for example, smoking) is required.

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