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Gender and Ethnic Differences in the Association Between Body Image Dissatisfaction and Binge Eating Disorder among Blacks

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Abstract

Background—The research on binge eating has overwhelmingly focused on Whites. We aimed to study gender and ethnic differences in the association between body image dissatisfaction and binge eating in a nationally representative sample of Black adults in the USA.

Methods—This cross-sectional study used data from the National Survey of American Life (NSAL), 2003–2004. Self-identified Caribbean Black (n = 1621) and African American (3570) adults aged 18 and older were enrolled. The independent variable was body dissatisfaction measured with two items. Using the World Health Organization Composite International Diagnostic Interview (WHO-CIDI), outcome was lifetime binge eating without hierarchy according to the DSM-IV criteria. Covariates included age, socioeconomic factors (i.e., education and marital status), and body mass index. Ethnicity and gender were focal moderators. Logistic regressions were used for data analysis.

Results—Despite comparable prevalence of lifetime binge eating (5 vs 4 %, $p > 0.05$), African Americans reported higher body image dissatisfaction than Caribbean Blacks (36 vs 29 %, $p > 0.05$). In the pooled sample, body dissatisfaction was a strong predictor of lifetime binge eating disorders. There was a significant interaction ($p = 0.039$) between ethnicity and body image dissatisfaction on binge eating, suggesting a stronger association between body image dissatisfaction and lifetime binge eating for Caribbean Blacks (OR = 11.65, 95 % 6.89–19.72) than African Americans (OR = 6.72, 95 % CI 3.97–11.37). Gender did not interact with body image dissatisfaction on binge eating.

Conclusion—Ethnic variation in the link between body image dissatisfaction and binge eating may be due to within-race cultural differences in body image between African Americans and Caribbean Blacks. This may include different definitions, norms, and expectations regarding the

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body size. Findings suggest that ethnicity may bias relevance of body image dissatisfaction as a diagnostic criterion for binge eating disorders among diverse populations of Blacks.

Keywords

Gender; Ethnicity; Binge eating disorder; Body image dissatisfaction

Introduction

Binge eating disorder (BED) is characterized by recurrent binge eating with the absence of the compensatory behaviors associated with bulimia nervosa [1]. Recurrent episodes of binge eating include loss of control over eating and eating more in a discrete period of time than expected. In DSM-IV, there is an additional frequency requirement of at least 2 days a week for 6 months on average [2, 3]. BED is highly correlated with obesity, heart disease, anxiety, and depression [4-7]. BED therefore represents a serious danger to individuals and society in terms of mortality, morbidity, and health care costs [7].

BED has a prevalence rate between 1 and 5 % in the general population, although estimates differ across studies [4, 5, 8, 9]. Importantly, BED prevalence seems to differ less across race, gender, and ethnic groups than do other eating disorders such as anorexia and bulimia [8, 10, 11]. However, some studies have found differences in prevalence and presentation of BED between racial and ethnic population groups. In 2011, a study documented higher prevalence of binge eating among ethnic minorities than non-Latino Whites [10]. In a 2015 study, Black treatment-seeking adults with BED had higher body mass index (BMI) and more frequent episodes of binge eating than their White counterparts, despite similar levels of eating disorder psychopathology [12]. Research on BED among minorities is limited to a few studies [8-14]. Such exceptions have almost exclusively focused on race; therefore, limited knowledge exists regarding ethnic differences in BED within Blacks [8-13].

BED has a higher tendency to appear in men compared to other eating disorders (i.e., anorexia and bulimia) [10, 11, 13]. In a 2007 study, equivalent prevalence of BED was found in men and women [9]. Therefore, more studies should focus on BED and binge eating in non-White, non-female populations [8]. This is particularly important given the contextual role of race, ethnicity, and gender in altering social and medical causes and consequences of obesity [6, 15-17].

Body image dissatisfaction is a core component of several eating disorders including BED [4, 6, 18]. According to the dual pathway model, body image dissatisfaction correlates with binge eating through negative affect and dietary restraint subsequently leading to binge eating episodes [19]. Previous research shows that obese individuals who engage in binge eating have higher body image dissatisfaction than obese individuals who do not binge [19, 20]. Furthermore, among obese women taking part in cognitive-behavioral treatment for obesity, reduction in body image dissatisfaction is associated with a reduction in binge eating [21]. This evidence suggests that body image dissatisfaction correlates with BED beyond the effects of obesity [5, 20]. However, as binge eating and body image contribute to obesity, studies that have limited their participants to obese individuals may have collider stratification bias [22, 23]. According to Berkson’s paradox, limiting the sample to obese

individuals may bias the correlation between binge eating and body image dissatisfaction [22-24].

The association between body image dissatisfaction and BED may depend on ethnicity. Studies have documented lower body image dissatisfaction associated with the desire to be thin among Black women compared to White women [25-28]. A strong racial identity seems to be inversely related to body image dissatisfaction among Black women [28, 29]. If body image dissatisfaction leads to bingeing, the association between body image dissatisfaction and binge eating is expected to be weaker for Blacks. However, this is not supported by the literature [9-11, 13]. Some studies have less normal eating behaviors and more concerns over body shape, weight, and ability to exercise among Black women with BED, compared to their White counterparts [8, 28, 29]. There are, however, studies showing that body image dissatisfaction may be similarly related to eating disorder among Blacks and Whites [28, 29]. Although body image dissatisfaction is an important correlate of binge eating, there is a knowledge gap on how this relationship differs by race and ethnicity.

Gender may also alter the association between body image dissatisfaction and BED [4, 5]. Several studies have shown that body image dissatisfaction affects more women than men, even when controlling for BED or binge eating [4, 5]. Whether this is the result of different societal and cultural pressures or other factors, once again, our knowledge is very limited on how the body image dissatisfaction-binge eating link varies by gender.

Given the gaps in the literature, the current study examines roles of gender and ethnicity in altering the association between body image satisfaction and binge eating, using a nationally representative sample of adults who participated in the National Survey of American Life (NSAL). Based on previous research [6, 15-17, 30-32], we expected gender and ethnicity to moderate the relation between body image satisfaction and BED. Specifically, we expected to observe a stronger association between body image satisfaction and BED among women than men [4, 5, 9]. We also expected that the effect will be stronger among African Americans than Caribbean Blacks due to cultural differences in perceptions of acceptable body ideals [19, 25-29]. Understanding ethnic groups of Blacks will help us address systemic health disparities by design and implementation of more effective interventions for populations other than White women.

Methods

Design and Setting

Data came from the National Survey of American Life (NSAL), 2001–2003 [30, 32-34]. The NSAL was approved by the institutional review board at the University of Michigan [30, 32]. A total of 5191 adults (African American [n = 3570] and Caribbean Blacks [n = 1621]) entered the study. All participants were over 18 years of age and not institutionalized for inclusion in for the present study. Gender distribution was relatively similar for both African Americans (44 % male, 56 % female) and Caribbean Blacks (51 % male, 49 % female) [30, 32-34].

Participants

Participants self-identified as either African American or Caribbean Black. Data collection took place between February 2001 and March 2003. The response rate was 73 %. Interviews were conducted mainly via laptop-assisted personal interviews in the homes of participants; however, in approximately 14 % of cases, interviews were conducted either fully or partially by telephone. All participants for this study lived in the continental USA.

Sampling and Sampling Frame

The NSAL has utilized a multi-stage sampling design, including both a core and supplemental sample. The core sample was a national area probability sample from which Whites and Blacks were sampled. The supplemental sample was drawn from areas of high Caribbean Black residential density, in a design closely resembling that of the National Survey of Black Americans, 1979–80.

Measures

The current study measured age (self-reported continuous variable in years), gender (male vs female), sociodemographic factors (education and marital status), region of country, ethnicity, body dissatisfaction, body mass index (BMI), and any lifetime binge eating. Demographic and socioeconomic factors are associated with binge eating and BED and could potentially confound the association. Thus, these variables were used as control variables in this study.

Ethnicity—In this study, ethnicity was considered as a moderator. Ethnic group in this study is composed of African Americans and Caribbean Blacks. Individuals were considered Caribbean Blacks if they met any of the following inclusion criteria: (1) being of West Indian or Caribbean descent, (2) being from a country in the Caribbean region, or (3) having parents or grandparents born in a country within the Caribbean region. Blacks who did not report Caribbean ancestry were considered African Americans [31, 32].

Sociodemographic Factors—To measure sociodemographic factors status, education and marital status were used as proxies. Education was a four-category categorical variable: (1) less than 12 years of education, (2) equal to12 years of education, (3) greater than 12 but less than or equal to 16 years of education, and (4) greater than 16 years of education. Marital status was a categorical variable consisting of three categories: (1) married, (2) widowed/divorced/separated, and 3) never married.

Binge Eating (Lifetime)—Any binge eating was measured using a modified version of the Composite International Diagnostic Interview Schedule (WHO-CIDI) [35-39], which has been frequently used for evaluation of eating behaviors and other psychiatric disorders [37, 38]. The WHO-CIDI is a standardized instrument that is consistent with DSM-IV and DSM-IV-TR (American Psychiatric Association, 1994) used to determine the probability that the respondent would be diagnosed with a psychiatric disorder if they underwent an interview with a psychiatrist. Any binge eating is classified as a behavior, not a symptom [35-38]. Any binge eating had a higher prevalence in the study sample and therefore provided more stable statistical analysis than full threshold binge eating. Additionally, support has been found for

a continuum hypothesis of binge eating, in which BED is a more severe form of binge eating differing quantitatively form binge eating but not qualitatively [40-42]. Any binge eating was defined as two or more periods of binge eating per week for at least 3 months. Further diagnostic criterion for any binge eating is provided in the Appendix Table 4.

Body Dissatisfaction—Body dissatisfaction was a scale created from two variables in the original survey that were closely correlated. The items included (1) “Was there ever a time in your life when you had a great deal of concern about or strongly feared being overweight?” and (2) “Do you consider yourself very overweight, somewhat overweight, only a little overweight, just right, or underweight?” For the first item, response options were yes or no, coded respectively as 1 and 5. The other item was coded as 1 through 5. The two responses were added together and divided by 2 to create the new variable, body dissatisfaction, where a higher score was assumed to indicate more satisfaction. Scores ranged from 1 to 5. Scores were then dichotomized into “No Body Image Dissatisfaction” = 0 and “Body Image Dissatisfaction” = 1. We built body image dissatisfaction scale based on a cognitive-emotional model. Therefore, we used two items, one cognitive (perception of obesity) and one emotional (concern about weight). In this view, an individual will have higher levels of body image dissatisfaction if the individual considers him-/herself overweight/obese and if such a realization results in considerable concern about being overweight [30, 43, 44].

Body Mass Index—In this study, BMI level was calculated based on self-reported weights and heights. Weight and height were collected in pounds (1 lb = 0.453 kg) and feet (1 ft = 0.3048 m)/inches (1 in. = 0.0254 m), respectively. The BMI levels were categorized based on the following cut-off points: equal to or larger than 25, 30, 35, and 40 kg/m^2. These categories of BMI represent underweight, normal weight, obesity class I, obesity class II, and obesity class III. BMI calculated using the self-reported weight and height is closely correlated with BMI based on direct measures of height and weight [45].

Region—Region was a categorical variable consisting of four categories: (1) East, (2) Midwest, (3) South, and (4) West. We decided to control for variable “region” because life circumstances, as well as SES, discrimination, religiosity, and health can vary by region, especially North vs South, in the USA [46, 47].

Statistical Analysis—We used Stata 13.0 (Stata Corp., College Station, TX) to perform data analysis. All analyses accounted for the complex sampling design. The Taylor series approximation technique was used to estimate the standard errors based on weights for strata, clusters, and non-response. Thus, all reported standard errors reflect the recalculation of variance using the study’s complex design. *P* values less than 0.05 were considered as statistically significant. Adjusted odds ratios (ORs) and 95 % confidence interval (CI) were reported. We used publically available NSAL data, which has replaced missing data using multiple imputations.

A series of survey logistic regressions were used for multivariable analysis by considering body dissatisfaction as the main predictor, any binge eating as the main outcome, and age, education, marital status, employment, and country region as controls. In the first step, we ran two logistic regressions in the pooled sample. The first model only included

main effects, while the second model also included the following two interaction terms: (1) gender × body dissatisfaction and (2) ethnicity × body dissatisfaction. In the next step, we ran separate models within ethnic and gender strata to estimate the association between body dissatisfaction and binge eating for each group separately. We did not use Lincom but estimated ORs within groups because among Blacks, men and women, and African Americans and Caribbean Blacks vastly differ in terms of socioeconomic status (education, employment, income, and marital status), nativity, discrimination, obesity rates, health status, and geographic residence. We wanted to observe the association between body dissatisfaction and binge eating for each group, given their unique social status. Main effects were kept in the models, in the presence of interactions, even when they were not significant.

Results

Participants

Table 1 shows sociodemographic information for African Americans and Caribbean Blacks. Mean age for African Americans was 42.3 and 40.9 for Caribbean Blacks. The majority of Caribbean Blacks (72 %) were born outside the USA, whereas only 2 % of African Americans were born outside the USA. Eighty-seven percent (87 %) of African Americans and 100 % of Caribbean Blacks lived in large cities. The majority of Caribbean Black respondents lived in the Northeast region (70 %), followed by the South (28 %), whereas the majority of African American respondents lived in the South (65 %) followed by the Midwest (17 %). The percentages of African Americans and Caribbean Blacks who experienced binge eating and body image dissatisfaction presented in Table 1 are weighted percentages but do not differ significantly.

The Association of Body Image Dissatisfaction and Ethnicity on Binge Eating

Table 2 shows model 1 and model 2. Model 1 is the main effect model for the logistic regression without the interaction. Based on model 1, education, marital status, region, and high body dissatisfaction were associated with BED. Body dissatisfaction was strongly associated with binge eating (OR = 6.94, 95 % CI 4.21, 11.44). Based on model 2, there was a significant interaction between body dissatisfaction and ethnicity (OR = 2.09, 95 % CI = 1.04, 4.190), suggesting that the correlation of body dissatisfaction and binge eating is stronger among Caribbean Blacks than among African Americans.

Table 3 presents four models specific to ethnic and gender groups. Effect of high body dissatisfaction on BED was higher among Caribbean Blacks (OR = 11.65, 95 % CI 6.89–19.72) compared to African Americans (OR = 6.72, 95 % CI = 3.97–11.37). Odds ratio for the effect of high body dissatisfaction on BED was 8.33 (95 % CI = 4.30–16.11) among men and 6.15 (95 % CI = 3.05–12.39) among women. (Table 3).

Discussion

This study is one of the first to examine binge eating in association with body image dissatisfaction among a nationally representative ethnically diverse sample of Black adults. We found that body image dissatisfaction had a stronger association with binge eating for

Caribbean Blacks than for African Americans. Our finding supports the hypothesis that ethnicity moderates the association between body image dissatisfaction and binge eating.

The buffering hypothesis may explain some of our findings, specifically the moderating effect of ethnicity on the association between body image dissatisfaction and binge eating. It is possible the association of body image dissatisfaction and binge eating is shaped by cultural attitudes on thinness, which differ across ethnic groups. Studies have found lower levels of body image dissatisfaction and desire to be thin in Blacks compared to Whites [27, 29, 45]. According to "buffering hypothesis" by Kahn and Powell, lower cultural motivation to be thin in Black communities may function as a protective factor against eating disorders among Blacks [48-50]. Under this hypothesis, altered association between body image dissatisfaction and binge eating based on ethnicity may be due to a stronger buffering effect of African American culture against body image dissatisfaction compared to Caribbean Blacks.

Buffering hypothesis, however, does not explain the equal prevalence of binge eating between African Americans and Caribbean Blacks. Under the buffering hypothesis, we would expect lower prevalence of body dissatisfaction and eating disorders in groups in whom cultural views on thinness act as a buffer. In classic models of eating disorder, body dissatisfaction leads to and compounds binge eating through negative affect [19]. Additionally, body dissatisfaction may also lead to restraint on diet and subsequent rebounds, or binges [19]. Yet there was no difference in prevalence of binge eating between African Americans and Caribbean Blacks in our study. Most research on buffering hypothesis exists for Blacks and Whites and suggests that Blacks have equal or near equal incidence of binge eating as Whites [8, 51]. Some researchers speculate that the same weight tolerant attitude protective for eating disorders such as anorexia nervosa and bulimia increases risk for binge eating [52]. Under this reasoning, despite low levels of body image dissatisfaction, African Americans show high levels of binge eating which suggests weaker comorbidity between the two [48-52]. In this model, the differential weight tolerant attitudes may contribute to differential susceptibility to binge eating across racial and ethnic groups.

Our findings have implications for measurement of binge eating across racial and ethnic groups. Taylor and colleagues argued that DSM-IV-TR classifications may be inadequate for the diagnosis of binge eating among African Americans and Caribbean Blacks. Authors further suggested that obesity should be classified as a symptom of BED in order to account for such differing symptomology in Blacks [53]. Differential validity of the WHO-CIDI in African Americans and Caribbean Blacks introduces another level of measurement bias based on ethnicity. Measured binge eating using lay interviewers would differently reflect risk of true binge eating across population groups, diagnosed by a clinician.

Another possible explanation for the different association between body image dissatisfaction and binge eating across ethnicities is the alternative pathways model. Populations may differently binge eat as a coping mechanism under exposure to stress [54, 55]. Social, environmental, and physical stressors as well as coping resources and styles vary based on ethnicity and gender [7, 30-32, 56]. According to this model, body image dissatisfaction—conceptualized as a source of stress—may differently result in binge

eating as a coping mechanism across ethnic groups. The differences observed between African Americans and Caribbean Blacks in the association of binge eating and body image dissatisfaction may dye to population difference in how people cope with stress.

We cannot rule out the role of “healthy immigrant effect” as a potential explanation of the stronger association among Caribbean Blacks compared to African Americans [57]. Based on this phenomenon, upon arrival in the USA, immigrants are healthier than native-born counterparts [57]. We also know that compared to African Americans, Caribbean Blacks have higher education, employment, and income [58]. This effect may be due to selection for healthier and motivated migrants able to resettle from a developing to developed nation [59]. Many Caribbean Blacks in the NSL are recent immigrants. Caribbean Blacks are more likely to experience binge eating in the presence of body image dissatisfaction due to higher socioeconomic status influencing thinner body image ideals [60, 61].

In our study, gender did not associate with binge eating and additionally did not interact with body image dissatisfaction on binge eating. This finding is in line with previous research showing similar prevalence among binge eating in men and women [8, 10]. Gender may be less relevant to binge eating in Black populations compared to Whites [8, 10]. As a result, traditional treatment and diagnostic methods developed for predominantly female patients with eating disorders such as anorexia and bulimia thus may not be relevant in the context of binge eating [8].

Eating disorders, especially binge eating, are not homogenous for all populations. Current clinical evaluation and diagnostic protocols for eating disorders exhibit bias towards a White model of disease and treatment. Clinicians may misdiagnose eating disorders in Black populations due to race-based stereotypes [62, 63]. Additionally, the existing eating disorder measures may fail to accurately detect eating disorders across race and ethnic minorities [64].

Findings of this study have clinical implications. The White model of disease diagnosis and treatment is not universally suitable for all ethnicities. Over simplification of diagnosis and treatment of these complex disorders to that typical of a White patient is inadequate. Clinicians should be trained on the needs of different populations by considering the associations between binge eating, depression, and anxiety when focusing on diagnosis and treatment.

The current study has several limitations. The scope of this study was limited to the association between body image dissatisfaction and BED, and we did not study risk for comorbid mental disorders. Future research should test whether body image dissatisfaction similarly leads to a wide range of mental disorders among Caribbean Blacks and African Americans or not. Despite the non-linear nature of the link between body image and eating disorders [65], we only focused on their linear association. It is likely that particular levels of body dissatisfaction have some threshold effects that cannot be captured by linear (gradient) effects. The cross-sectional design of the study limited any causal inference from our findings. Our results should not be interpreted as prevalence ratios that differ from odds ratios reported here [66, 67]. Finally, group differences in validity of the WHO-

CIDI for measurement of binge eating are unclear. However, good concordance has been found between core WHO-CIDI diagnoses and diagnoses based on the Structured Clinical Interview for DSM-IV (SCID) in a probability sub-sample of National Comorbidity Survey-replication (NCS-r) respondents who were administered clinical re-appraisal interviews, according to the literature reviewed on the validity of CIDI and DSM-IV criteria for eating disorders [9, 68, 69]. Unequal validity of CIDI for diagnosis of binge eating could result in differential level of misclassification bias in African Americans or Caribbean Blacks. Such differential misclassification bias across ethnic groups could be a potential source of differential link between body image dissatisfaction and binge eating based on ethnicity.

Despite these limitations, the current study had multiple strengths such as nationally representative sampling, use of structural interview for diagnosis of binge eating, and large sample of Blacks. This study did not rely on measuring the symptoms of BED but rather used a comprehensive interview to measure binge eating using the WHO-CIDI [70].

In conclusion, body image dissatisfaction, often assumed to be at the root of eating disorders, may not be similarly indicative of risk of binge eating across ethnic groups of Blacks. More research into the complex interwoven associations between race, social class, comorbidities, binge eating, body image, obesity, and mental health is needed [71-73]. Limiting eating disorder research to White women excludes important information on how race, ethnicity, and gender impact causes and consequences of binge eating in diverse populations.

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Appendix

Table 4

The algorithm used for diagnosis by CIDI

Key diagnostic features of BED in CIDI
Recurrent and persistent episodes of binge eating
a. Binge eating is eating in a period of time (e.g., within any 2-h period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances,
b. Accompanied by a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)
Binge eating episodes are associated with 3 or more of the following
c. Eating much more rapidly than normally
d. Eating until uncomfortable full
e. Eating large amounts of food when not feeling physically hungry
f. Eating alone because one is embarrassed about how much one is eating

g. Feeling disgusted with oneself, depressed, or very guilty after overeating

Marked distress regarding binge eating

Binge eating at least 2 days a week for 3 months

Absence of regular compensating behaviors (such as purging)

Key diagnostic features of binge eating any in CIDI

Recurrent and persistent episodes of binge eating

a. Binge eating is eating in a period of time (e.g., within any 2-h period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances

b. Accompanied by a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)

Binge eating occurs at least two times a week for at least 3 months

WHO-CIDI, version 3.0, in NCS-R Interview Schedule and Respondent Booklet, Section 24: Eating Disorders

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Table 1

Sociodemographic data among African Americans and Caribbean Blacks

Characteristic	African Americans *N* = 3570		Caribbean Blacks *N* = 1621	
	Mean	**SE**	**Mean**	**SE**
Age (years)	42.3	.5	40.9	.9
	n	**%**	***n***	**%**
Sex				
Male	1271	36	643	40
Female	2299	64	978	60
Birthplace *				
Inside the USA	3464	97	440	27
Outside the USA	64	2	1166	72
Living place *				
Large city	3105	87	1621	100
Other urban	312	9	0	0
Rural area	153	4	0	0
Region *				
Northeast	411	12	1135	70
West	234	7	18	1
Midwest	595	17	12	1
South	2330	65	456	28

Chi-square is used for comparisons

* $p < 0.05$

Table 2

Summary of logistic regression in the pooled sample

	Model 1 Without interaction term		Model 1 With interaction term	
	OR (SE)	**95 % CI**	**OR (SE)**	**95 % CI**
Gender (females)[a]	0.84(0.17)	0.55–1.26	0.76(0.22)	0.43–1.37
Ethnicity (African American)[b]	0.63(0.25)	0.29–1.39	1.09(0.46)	0.46–2.55
Age	0.99(0.007)	0.97–1.00	0.99(0.007)#	0.98–1.00
Education[c]				
12 years	1.07(0.24)	0.69–1.67	1.07(0.24)	0.69–1.66
13–15 years	0.59(0.16)#	0.34–1.03	0.59(0.16)#	0.34–1.03
Greater than or equal to 16 years	0.46(0.15)*	0.24–0.89	0.46(0.15)*	0.24–0.88
Years in the USA	0.79(0.19)	0.49–1.27	0.79(0.19)	0.49–1.28
Region[d]				
Midwest	2.17(0.50)**	1.36–3.46	2.17(0.51)**	1.35–3.49
South	1.06(0.24)	0.67–1.66	1.06(0.25)	0.67–1.70
West	2.08(0.62)*	1.15–3.76	2.10(0.63)*	1.14–3.84
Marital status[e]				
Divorced/separated/widowed	1.73(0.37)*	1.13–2.65	1.73(0.37)*	1.14–2.64
Never married	1.53(0.44)	0.86–2.72	1.53(0.44)	0.87–2.72
High body dissatisfaction	6.94(1.73)***	4.21–11.44	16.11(5.66)***	7.96–32.57
Body dissatisfaction × gender (females)	–	–	1.29(0.64)	0.48–3.49
Body dissatisfaction × African American	–	–	0.48 (0.17)*	0.24–0.96

OR adjusted odds ratio, *SE* standard error

# $p < 0.10$

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

[a] Males as the reference group

[b] Caribbean Blacks as the reference group

[c] 11 years or less as the reference group

[d] Northeast as the reference group

[e] Married as the reference group

Table 3

Summary of logistic regression based on ethnicity and gender

	Model 1		Model 2		Model 3		Model 4	
	OR (SE)	95 % CI	OR (SE)	95 % CI	OR (SE)	95 % CI	OR (SE)	95 % CI
	Caribbean Blacks		African American		Men		Women	
Gender (females)[a]	1.67(0.76)	0.66–4.26	0.80(0.17)	0.52–1.23	–	–	–	–
Ethnicity (African American)[b]	–	–	–	–	1.39(0.91)	0.38–5.14	0.43(0.22)	0.15–1.22
Age								
Education[c]	1.01(0.02)	0.96–1.06	0.99(0.01)#	0.97–1.00	0.99(0.01)	0.96–1.01	0.99(0.01)	0.97–1.01
12 years	2.22(1.25)	0.70–7.10	1.03(0.23)	0.65–1.63	1.20(0.51)	0.51–2.81	0.99(0.27)	0.57–1.71
13–15 years	0.85(0.42)	0.31–2.39	0.57(0.16)#	0.32–1.02	0.31(0.19)#	0.09–1.03	0.71(0.21)	0.40–1.27
Greater than or equal to 16 years	1.14(0.94)	0.21–6.23	0.45(0.15)*	0.23–0.91	0.97(0.48)	0.36–2.63	0.21(0.09)***	0.09–0.49
Years in the USA	0.88(0.21)	0.54–1.43	–	–	0.91(0.25)	0.52–1.57	0.73(0.24)	0.37–1.42
Region[d]								
Midwest	5.21(4.62)#	0.83–32.62	2.10(0.52)**	1.26–3.48	3.28(1.97)#	0.98–10.96	1.77(0.55)#	0.95–3.30
South	1.77(0.42)*	1.08–2.90	1.01(0.25)	0.62–1.67	1.30(0.67)	0.46–3.65	0.96(0.22)	0.61–1.51
West			2.25(0.69)*	1.20–4.19	2.47(1.73)	0.61–10.06	1.83(0.49)*	1.06–3.14
Marital status[e]								
Divorced/separated/widowed	1.73(1.27)	0.38–7.91	1.74(0.39)*	1.11–2.73	1.45(0.52)	0.70–2.97	1.80(0.46)*	1.08–3.00
Never married	3.94(3.09)#	0.78–19.95	1.44(0.43)	0.78–2.65	1.94(0.79)	0.86–4.37	1.40(0.45)	0.74–2.65
High body dissatisfaction	11.65(2.96)***	6.89–19.72	6.72(1.74)***	3.97–11.37	8.33(2.74)***	4.30–16.11	6.15(2.15)***	3.05–12.39

OR adjusted odds ratio, *SE* standard error

# $p < 0.10$

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

[a] Males as the reference group

[b] Caribbean Blacks as the reference group

[c] 11 years or less as the reference group

[d] Northeast as the reference group

[e] Married as the reference group