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Food cravings, binge eating, and eating disorder psychopathology: Exploring the moderating roles of gender and race

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Abstract

Objective—To examine the moderating effects of gender and race on the relationships among food cravings, binge eating, and eating disorder psychopathology in a community sample.

Methods—Data were collected from a convenience sample of 320 adults (53% male; mean age 28.5±8.2 years; mean BMI 27.1±5.2 kg/m^2; mean education 15.1±2.2 years; 64% white, 24% black, and 13% other race) participating in a cross-sectional study examining the interactions between stress, self-control and addiction. Participants completed a comprehensive assessment panel including a demographic questionnaire, the Food Craving Inventory, and Eating Disorder Examination Questionnaire. Data were analyzed using multiple logistic regression for binge eating behavior and multiple linear regression for eating disorder psychopathology.

Results—Overall, food cravings demonstrated significant main effects for binge eating behavior (adjusted OR=2.65, p<.001) and global eating disorder psychopathology (B=.47±.09, p<.001). Females had a stronger relationship between food cravings and eating disorder psychopathology than males; there were no statistically significant differences by race.

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Conclusion—These findings, based on a diverse sample recruited from the community, suggest that food cravings are associated with binge eating and eating disorder psychopathology and may represent an important target for interventions.

Keywords

Food cravings; binge eating; gender; race

1. Introduction

Food cravings are an intense and specific desire to consume a certain food or food type that is hard to resist. Food cravings are a commonly experienced phenomenon among the general population[1]; however, frequent food cravings may lead to unwanted consumption of craved foods and trigger feelings of guilt and shame[2]. Hence, food cravings may be associated with disordered eating and eating disorder psychopathology.

Food cravings are a frequently cited antecedent of binge eating (i.e., the consumption of an objectively large amount of food in a short period of time while feeling a loss of control[3]) and correlate of eating disorder psychopathology. The Functional Analysis Model of Binge Eating posits that food cravings are a proximal antecedent of binge eating[4]. Researchers have empirically demonstrated this theoretical relationship, finding that food cravings are associated with binging in women with bulimia nervosa[5] and women with binge eating disorder[6-9]. Among a sample of college students, researchers found a relationship between increased food cravings and eating disorder psychopathology[10]. Yet these studies have primarily focused on samples of women. Additionally, despite the importance of socio-cultural factors in people's food choices[11], there is a paucity of studies that have examined potential socio-cultural moderators such as gender and race.

It has been reported that there are gender differences in eating disorder psychopathology and the type and amount of food cravings; however, there have been some conflicting results. Gender differences in food cravings and eating behaviors may result from numerous factors including psychological or physiological changes related to menstruation[12,13], differences in nutrition awareness and knowledge[14], cultural influences, and differences in dietary and mood-regulating neurotransmitters[15]. While some researchers have found differences in the prevalence of general food cravings with cravings being more common in females than males[10,16], others have found no differences[17]. Researchers have also examined differences in the type of foods craved, finding that woman crave more sweets[18-20] and carbohydrates than males[21]. Binge eating and eating disorder psychopathology are more common among females; however, a substantial amount of males experience binge eating and meet criteria for BED. The prevalence estimates for binge eating and BED (recurrent episodes of binge eating associated with marked distress and without regular compensatory behaviors[3]), are approximately 4.9-11.2% and 3.6%, respectively, for women and 4.0-7.5% and 2.1%, respectively, for males[22-24]. While researchers have found that there are few differences in distal antecedents (e.g., age at first overweight, age at first diet, weight cycling) of binge eating by gender[25,26], only a few studies have examined gender differences of more proximal correlates of binge eating such as food cravings[10,12,27]. In a recently published

study comparing chocolate cravings in undergraduate men and women, male chocolate cravers had significantly fewer symptoms of eating disorders compared to male non-cravers[28]. These results suggest the relationship between disordered eating and chocolate craving may be unique to women; however, it remains to be determined whether this is unique to chocolate or if this finding may generalize to other food types.

Researchers have demonstrated that binge eating and BED are found in certain racial (e.g., black) and ethnic (e.g., Latino) groups at comparable rates relative to non-Latino whites[29,30]; however, there is a paucity of research that examines models of disordered eating that account for race. While it has been reported that disordered eating is a cultural-bound syndrome[31,32], we are just beginning to understand differences and similarities in correlates and symptomatology among diverse groups. Of the studies that have been conducted, differences have been found between blacks and whites in terms of binge eating correlates such as depression[33], BMI[34], and eating disorder features such as dietary restraint, history of eating disorders, and eating disorder psychopathology[35]. Others have found that among black and white women with BED, there are no differences in mental, physical, and parental and family characteristics[36]. There is also evidence that Hispanics having greater eating restraint, concerns, and psychopathology compared to blacks[36] and whites[34]. Given that obesity disproportionally impacts blacks[37] and binge eating is associated with increased BMI[35,38], further understanding of differences in associated correlates is necessary to create relevant interventions for these populations.

There are close connections between socio-cultural factors and eating behavior[11], yet we do not know the role that socio-cultural factors (e.g., gender and race) play in our understanding of the relationship between food cravings and disordered eating: much of our understanding of these relationships is gender and race-specific. The current study builds upon prior research by exploring the potential moderating roles of gender and race in the relationships between food cravings, binge eating, and eating disorder psychopathology in a sample of adult volunteers from the community. In this study, we extend the literature by including a more comprehensive examination of cravings for different types of food including sweets, carbohydrates/starches, high fat and fast-food fats and by examining the role of race.

2. Methods

2.1 Participants

The participants for this study were recruited as part of a larger consortium project and part of a human subjects core that included a set of interdisciplinary studies with the overall goal of examining the mechanisms underling stress, self-control, and addictive behaviors (http://medicine.yale.edu/stress/about/). The consortium used common measures across studies to form an integrated dataset that was used in this study. We recruited participants using advertisements soliciting interest in research on general health in local newspapers and flyers at community centers and churches in New Haven, Connecticut. Inclusion criteria were that participants were 18-50 years of age and able to read English at the sixth grade level. Exclusion criteria were pregnancy, dependence on any drug other than nicotine, use of prescribed medications for any psychiatric disorders, and medical conditions that would

preclude participation in the study. Due to a low number of underweight individuals in this sample (n=4), participants with a BMI<18.5 kg/m^2 were excluded from analysis.

Three hundred and twenty adults were included in this study with a mean age of 28.53 years (*SD*=8.21), mean BMI of 27.14 kg/m^2 (*SD*=5.18). A little more than half of the sample (53.4%) was male. The majority of the sample (63.7%) identified as White, 23.8% as Black, and 12.5% as "other". The mean education level of the sample was 15.06 (*SD*=2.19) years with 48.1% with college or more education, 37.8% with partial college, and 13.4% with high school or less education.

2.2 Procedures

The larger parent study was reviewed and approved by the Yale University Institutional Review Board. All study procedures were conducted at the Yale Stress Center. Eligibility was determined using an initial screening over the telephone or in person. Next, eligible participants met with a research assistant for a 2-hour intake session to obtain informed consent and begin assessments. Following the intake session, participants completed a comprehensive assessment battery of self-report questionnaires over three to four sessions. Participants were compensated $20 for each assessment session.

2.3 Measures

2.3.1 Demographics/BMI—A demographic data form designed for this study was used to collect data on age, gender, race, and educational attainment. A research nurse or trained research staff member measured each participant's height and weight following a standard procedure using a physician's scale and height rod. BMI was calculated from the measured heights and weights.

2.3.2 Food cravings—Food cravings, defined as an intense desire to consume a particular food (or food type) that is difficult to resist, were measured using the Food Craving Inventory (FCI)[39]. The FCI is a 28-item self-report measure that assesses general and specific types of food cravings. Participants are asked to rate how often each food was craved over the past month using a 5-point Likert scale ranging from ranging from 1 (never) to 5 (always/almost every day). Four subscales measure specific types of food cravings: high fat foods (fried chicken, sausage, gravy, fried fish, bacon, cornbread, hot dogs, steak), complex carbohydrates/starches (rolls, pancakes/waffles, biscuits, sandwich bread, rice, baked potato, pasta, cereal), sweets (brownies, cookies, candy, chocolate, donuts, cake, cinnamon rolls, ice cream), and fast-food fats (hamburger, French fries, chips, pizza). We calculated a total score by averaging the ratings from all 28 items. Subscale scores are calculated based on the means of the items included on each subscale. The FCI has demonstrated content validity from experts in eating behaviors, concurrent validity with the Conceptual Craving Scale[40] and disinhibition and hunger scales of the Three Factor Eating Questionnaire (TFEQ) [41], and discriminant validity with the restraint scale of the TFEQ. The FCI has acceptable internal consistency reliability and test-retest reliability in adults[39]. Further psychometric support for the FCI has been established in diverse community and clinical samples[42,43]. In the current study, there was acceptable internal consistency for general food cravings (Cronbac's alpha=92), high fats (Cronbac's alpha=.81), sweets

(Cronbac's alpha=84), and carbohydrates/starches (Cronbacs alpha=.81). The Cronbach's alpha for fast-food fats was .69.

2.3.3 Binge eating and eating disorder psychopathology—Binge eating behavior and global eating disorder psychopathology were assessed with the Eating Disorder Examination-Questionnaire with instructions (EDE-Q-I)[44]. The EDE-Q is a self-report version of the interviewer-based EDE that assesses core behavioral features of eating disorders (i.e. binge eating, vomiting) and associated psychopathology. The 36-item questionnaire assesses different forms of overeating, including two questions used to determine the frequency of "objective bulimic episodes" (which correspond to the DSM definition of binge eating) during the past 28 days. The EDE-Q, revised with instructions about the concepts of binge eating (EDE-Q-I) to improve reliability[45], has received support for assessing binge eating and binge eating disorder in both community and clinical populations[46-48]. Other eating behaviors and eating disorder psychopathology are measured using a 7-point Likert scale. The EDE-Q-I has four subscales (Restraint, Eating Concern, Weight Concern, and Shape Concern) and a global score for eating disorder psychopathology is calculated based on their mean. These scores are generated from 22 items on attitudinal aspects of eating disorder psychopathology. Frequencies of eating disorder behaviors do not contribute to subscale scores. The scores for the global eating disorder psychopathology subscale range from 0 to 6 with higher scores indicating greater severity. The Cronbach's alpha for global eating disorder psychopathology for this sample was .87, indicating good reliability.

2.4 Data Analysis

Data analyses were performed using SPSS v.21 (SPSS Inc., Armonk, NY). We categorized binge eating into 0 episodes of binge eating in the past month (coded as a 0) or ≥1 episode of binge eating in the past month (coded as a 1).

Correlation analyses were conducted to examine bivariate relationships between study variables. T-tests were performed to assess gender differences in food cravings and global eating disorder psychopathology. Chi-square tests were used to assess gender and race differences in binge eating. Kruskal-Wallis tests were used to assess differences by race for food cravings and global eating disorder psychopathology. Follow-up tests were conducted using the Mann-Whitney U tests.

We used multiple logistic regression analyses with the independent variable of general food cravings and binary outcome of binge eating behavior and multiple linear regression with the outcome of global eating disorder psychopathology. To explore cravings for individual types of food, we used backward stepwise regression analyses. Variables that did not make a statistically significant contribution to how well the model estimated each outcome were removed. This process is recommended for exploratory models as it helps limit the risk of type II error[49]. Continuous variables were mean centered before being entered into the model. Due to potential confounding effects, these models were estimated with and without adjusting for BMI, age, gender, race, and educational attainment (categorized into high school or less, partial college, and college or more). To test differences by gender and race,

we entered interaction terms for gender and race with food cravings. Statistical significance was defined as p-values <.05 and all tests were two-tailed. No adjustments were made for multiple comparisons.

3. Results

3.1 Descriptive and Bivariate Statistics

There were no differences in gender by race (Table 1). We found no differences in age, BMI, or educational level by gender and no differences in age by race. Individuals who were white had a significantly lower BMI compared to blacks (p=.03) with no differences between blacks or whites and individuals who were classified as other. We found significant differences in educational attainment by race (χ^2 (4, N=318; 40.54), p<.001) with whites having significantly more individuals with college or more education (58.6%; adjusted residual=4.8) and blacks having significantly more individuals with partial college (53.9%; adjusted residual=3.3) or high school or less education (27.6%; adjusted residual=4.1). There were no significant differences in educational attainment between blacks or whites and individuals classified as other.

The mean for general food cravings was 1.91 (SD=.59). The highest craved foods were fast-food fats (M=2.27, SD=.77) and sweets (M=2.07, SD=.75) followed by complex carbohydrates and starches (M=1.81, SD=.69) and high fats (M=1.67, SD=.67). Twenty-seven percent of the sample endorsed binge eating at least once over the past 28 days. Of the individuals who endorsed binge eating, the mean number of binge episodes in the past month was 4.33±4.91. The mean score of global eating disorder psychopathology was 1.13 (SD=1.07).

Females had significantly higher cravings for sweets (t(318)=4.61, p<.001; Table 2) and global eating disorder psychopathology (t(284)=5.40, p<.001; Table 3) but there were no significant differences by gender for cravings for high fats, complex carbohydrates/starches, fast-food fats, general food cravings, or binge eating. We found significant differences by race for high fats (χ^2(2, N=320)=40.85, p<.001), sweets (χ^2 (2, N=320)=14.48, p=.001), complex carbohydrates/starches (χ^2 (2, N=320)=14.13, p=.001), fast-food fats (χ^2 (2, N=320)=16.45, p<.001), and general food cravings (χ^2 (2, N=320)=28.16, p<.001). Post-hoc analyses demonstrated that blacks had higher levels on general food cravings and each type of food craving compared to whites (p<.001). Compared to whites, individuals classified as other had higher cravings for high fats (p=.02) with no significant differences in the other types of food cravings. Compared to blacks, individuals classified as other had lower cravings for high fats (p=.003), fast-food fats (p=.02) and total food cravings (p=.03). There were no significant differences by race for binge eating and global eating disorder psychopathology. Individuals who had high school or less education has significantly more cravings for high fats than individuals with partial college or college or more education (χ^2 (2, N=318)=6.78, p=.03) but there were no significant differences for cravings for sweets, complex carbohydrates/starches, fast food fats, general food cravings, binge eating, or eating disorder psychopathology.

3.2 Logistic and Linear Regressions for General and Specific Food Cravings

In unadjusted analyses, general food cravings were significantly associated with binge eating (OR=2.16, $p<.001$) and global eating disorder psychopathology (B=.51±.09, $p<.001$). After adjusting for BMI, age, race, gender, and educational attainment, general food cravings remained significantly associated with binge eating (adjusted OR=2.65, $p<.001$) and global eating disorder psychopathology (B=.47±.09, $p<.001$; Table 4). To examine qualitative differences between different types of food cravings, we substituted the general food craving score with the four types of food cravings. In unadjusted models, both cravings for sweets (OR=1.53, $p=.04$) and complex carbohydrates/starches (OR=1.71, $p=.05$) were retained in the model for binge eating behavior. After adjusting for BMI, age, race, gender, and educational attainment, results were similar with sweets (adjusted OR=1.47, $p=.09$) and complex carbohydrates/starches (adjusted OR=1.73, $p=.02$) retained in the model for binge eating behavior. In unadjusted analyses, cravings for sweets (B=.48±.08, $p<.001$) was positively associated with eating disorder psychopathology. After adjusting for BMI, age, race, gender, and educational attainment, sweets (B=.24±.08, $p=.003$) and complex carbohydrates/starches (B=.23±.09, $p=.009$) were retained in the model for eating disorder psychopathology. The variance inflation factor for the variables ranged from 1.04-1.36 and the tolerance ranged from .74-.97, indicating low multicollinearity between variables.

3.3 Logistic and Linear Regressions for General and Specific Food Cravings by Gender

To test whether there were differences in food cravings by gender we added interaction terms. First we tested the model for general food cravings. With and without adjusting for BMI, age, race, and educational attainment, the interaction terms were not statistically significant in the models for binge eating behavior ($p>.05$). The interaction term in the model for global eating disorder psychopathology was statistically significant before adjusting for other variables (B=-.52, $SE=.19$, $p=.006$) and remained significant after adjusting for BMI, age, race, and educational attainment (B=-.34, $SE=.19$, $p=.04$; Table 4). This suggests that the relationship between food cravings and global eating disorder psychopathology is stronger among females than males.

Next we tested a model for each type of food craving. All lower order terms were entered into the model. Next, interaction terms between gender and each type of food craving were added using backward stepwise logistic regression. No interaction terms remained in the model in the final step for binge eating behavior and global eating disorder psychopathology ($p>.05$) in either the unadjusted model or model adjusting for covariates.

3.4 Logistic and Linear Regressions for General and Specific Food Cravings by Race

To test whether there were differences in food cravings by race we added interaction terms. None of the interaction terms were statistically significant in the models for general food cravings ($p>.05$) before or after adjusting for covariates. Next we tested a model for each type of food craving. All lower order terms were entered into the model. Next, interaction terms between each race and each type of food craving were added using backward stepwise logistic regression. No interaction terms remained in the model in the final step for binge eating behavior and global eating disorder psychopathology ($p>.05$) in unadjusted or adjusted models.

4. Discussion

We found that food cravings were associated with binge eating and eating disorder psychopathology in a diverse, sample of adults recruited from the community. Our findings demonstrate that the relationship between food cravings and global eating disorder psychopathology is stronger in females than males. However, we found no effect by race and no differences by gender or race in the relationships between food cravings and binge eating. This suggests that food cravings may be important to target for individuals across gender and race and expands our knowledge of socio-cultural factors associated with disordered eating.

Comparable to other studies, we found that females had significantly higher cravings for sweets than males[19,50]. Another recent study found that females who were obese/overweight were more likely to experience cravings than males despite comparable binge eating severity[27]. Our hypothesis of gender moderation was only partially supported, though it does corroborate prior work suggesting significantly higher associations between general food cravings, chocolate cravings, and eating disorder psychopathology for females[10,28]. Though all food cravings are clearly not pathological, the results suggest that females who experience high levels of food cravings may also have increased eating disorder psychopathology. This adds to the body of literature that demonstrates differences between males and females in eating behaviors and eating disorder psychopathology. For example, women tend to prefer sweet foods like chocolate versus men who typically prefer savory foods and dieting is more common in women than men[15,51].

Though blacks had higher food cravings, we did not find any moderating effects of race for the relationship between food cravings and binge eating and global eating disorder psychopathology. However, contrary to research suggesting a higher 12-month prevalence of binge eating in blacks compared to whites[29], we found no differences in the 28-day prevalence of binge eating, a finding that parallels the absence of racial differences in BED[29,52] and binge-eating frequency among treatment-seeking adults with BED[34]. Whereas we found that there were no statistically significant differences across races for global eating disorder psychopathology, a recent study of treatment-seeking patients with BED also reported no differences between blacks and whites but that Latinas had higher eating disorder psychopathology than whites[34]. Taken together, our results suggest that the relationship between food cravings and binge eating and global eating disorder may generalize reasonably well across races and thus may represent a potentially generalizable target for interventions. This also provides support for the generalizability of the Functional Model of Binge Eating across different races [4] and evidence that food cravings may be a relevant target for prevention and treatment interventions for binge eating across different races. Additionally, this highlights the importance of including diverse samples in studies examining food cravings and disordered eating. Future replication is necessary in different geographic locations to examine whether these findings generalize across cultures and with other races/ethnicities such as Hispanics and Asians.

In the total sample, increased food cravings were associated with binge eating and global eating disorder psychopathology. These findings support the Functional Analysis Model of

Binge Eating[4] and psychological models of binge eating[5]. These are also consistent with prior literature suggesting a relationship between increased food cravings and binge eating and eating disorder psychopathology[7,53]. Similar to previous suggestion that cravings for sweets are related to binging[6], we found that in the total sample, cravings for sweets and cravings for complex carbohydrates/starches were independently associated with binge eating. These results are perhaps consistent with the carbohydrate craving theory (i.e., a biological deficit theory whereby carbohydrates elevate mood by increasing serotonin) [54,55], that remains controversial and characterized by very mixed findings[56-58]. We should emphasize that the mix of foods included in the FCI complex carbohydrate/starches subscale (i.e., rolls, pancakes/waffles, biscuits, sandwich bread, rice, baked potato, pasta, cereal) contains some foods that are also high in fats. Future study is necessary to examine whether cravings for specific macronutrients results in consumption of these same macronutrients, whether it is carbohydrates alone or a mixture of carbohydrates and fats that increases risk for binge eating, and the role of mood in these relationships.

The results of this study must be interpreted in light of several limitations. First, binge eating was measured using self-report; however, the EDE-Q has been demonstrated to have good concurrent validity and acceptable criterion validity for assessing general eating disorder psychopathology and binge eating in community samples[59]. Additionally, the use of the EDE-Q with instructions is more strongly correlated with results using interview techniques[60]. Additionally, we excluded participants who were taking prescribed psychiatric medications. This may limit generalizability as binge eating and eating disorder psychopathology are frequently comorbid with other psychiatric disorders [61]. There is also the possibility of a floor effect, as levels of eating disorder psychopathology, binge eating, and food cravings were relatively low. Our sample's scores on eating disorder psychopathology were somewhat lower than other samples[59,62]; however, the scores on the FCI[17] and number of individuals endorsing binge eating in the last 28 days were consistent with other reports[63]. Lastly, much heterogeneity exists in broad definitions of different race and sociocultural groups. Further research is necessary to examine the role of ethnicity (e.g., cultural traits) and other sociocultural factors (e.g., income level) in these relationships.

In conclusion, regardless of gender and race, food cravings may be an important correlate of binge eating and eating disorder psychopathology. Studies are needed to explore potential models and mechanisms. These findings preliminarily suggest that food cravings may be an important target for eating disorder interventions.

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Highlights

- We examined associations between food cravings, binge eating, and eating psychopathology and the moderators of gender and race.
- Food cravings were associated with binge eating and eating psychopathology.
- Females had a stronger association between food cravings and eating psychopathology.
- There were no significant differences by race.

Table 1

Demographic characteristics by gender and race (n=320)

		Gender					Race						
		Male (n=171)		Female (n=149)		P-value	White (n=204)		Black (n=76)		Other (n=40)		P-value
		M or N	SD or %	M or N	SD or %		M or N	SD or %	M or N	SD or %	M or N	SD or %	
Age		29.34	8.23	27.61	8.11	.06	28.13	8.05	29.99	8.80	27.80	7.68	.20
BMI (kg/m^2)		27.04	4.91	27.26	5.50	.70	26.64	5.00	28.52	5.49	27.11	5.34	.03
Education	High school or less	23	53.5%	20	46.5%	.96	17	39.5%	21	48.8%	5	11.6%	<.001
	Partial college	64	52.9%	57	47.1%		67	55.4%	41	33.9%	13	10.7 %	
Gender	Female	---	---	---	---	---	87	58.4%	37	24.8%	25	16.8%	.07
Race	Black	39	51.3%	37	48.7%	.07	---	---	---	---	---	---	---
	White	117	57.4%	87	42.6 %		---	---	---	---	---	---	---

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Table 2

Comparisons of food cravings by gender and race (n=320)

	Gender						Race							
	Male (n=171)		Female (n=149)		t or χ^2	P-value	White (n=204)		Black (n=76)		Other (n=40)		χ^2*X*	P-value
	M	SD	M	SD			M	SD	M	SD	M	SD		
FCI High fats	1.74	.69	1.60	.63	-1.87	.06	1.49	.49	2.17	.85	1.68	.57	40.85	<.001
FCI Sweets	1.89	.71	2.27	.75	4.61	<.001	1.94	.68	2.32	.79	2.23	.87	14.48	.001
FCI Complex carbohydrates/starches	1.76	.69	1.86	.68	1.25	.21	1.69	.58	2.10	.84	1.87	.70	14.13	.001
FCI Fast food fats	2.24	.79	2.30	.75	.69	.49	2.15	.69	2.60	.89	2.25	.73	16.45	<.001
FCI General	1.86	.60	1.96	.58	1.56	.12	1.77	.46	2.25	.74	1.97	.59	28.16	<.001

Note. FCI=Food Craving Inventory. FCI range, 1 (lowest) to 5 (highest). M=Mean. SD=Standard deviation.

X Kruskal-Wallis mean rank.

Table 3

Comparisons of binge eating, and eating disorder psychopathology by gender and race (n=320)

	Gender						Race							
	Male (n=171)		Female (n=149)		t or χ^2	P-value	White (n=204)		Black (n=76)		Other (n=40)		χ^2 X	P-value
	M or N	SD or %	M or N	SD or %			M or N	SD or %	M or N	SD or %	M or N	SD or %		
Binge eating behavior	42	24.6 %	44	29.5 %	1.00	.32	57	27.9 %	18	23.7 %	11	27.5 %	.52	.77
Eating disorder psychopathology	.83	.91	1.46	1.13	5.40	<.001	1.12	1.05	1.12	1.08	1.36	1.12	4.09	.13

Note. FCI=Food Craving Inventory. M=Mean. SD=Standard deviation.

X Kruskal-Wallis mean rank.

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Table 4

Logistic and linear regression models for general food cravings

Block	Variables		Binge eating behavior				Global eating disorder psychopathology				
			OR[a]	P-value	95% CI		Unstandardized		Standardized	t	P-value
					Lower	Upper	B	SE	Beta		
1	BMI		1.09	.001	1.03	1.14	.10	.01	.48	9.74	<.001
	Age		1.01	.49	.98	1.04	-.001	.01	-.005	-.11	.92
	Race[+]	Black	.63	.18	.32	1.24	-.37	.13	-.15	-2.86	.004
		Other	.90	.80	.41	1.99	.05	.16	.02	.34	.73
	Male		.74	.26	.44	1.24	-.62	.10	-.29	-6.19	<.001
	Education[++]	Partial college	1.22	.51	.68	2.16	.12	.11	.06	1.07	.29
	High school or less		.70	.43	.29	1.68	.08	.16	.03	.48	.63
2[b]	FCI general		2.65	<.001	1.62	4.32	.47	.09	.27	5.47	<.001
3[b,c]	FCI general*Male		.66	.36	.27	1.62	-.34	.16	-.14	-2.08	.04
4[b,d]	FCI general*Black		1.01	.99	.35	2.94	-.30	.19	-.11	-1.64	.10
	FCI general*Other		1.35	.70	.29	6.24	.04	.27	.007	.13	.89

Note. FCI=Food Craving Inventory

[a]OR=odds ratio.

[b]The OR is from the multiple logistic regression model adjusted for BMI, age, race, gender, and education.

[c]Block 3 is an interaction between general food cravings and gender.

[d]Block 4 is an interaction between general food cravings and race. Since the block 3 interaction was not significant, the gender interaction term was dropped for Block 4.

[+]White is reference category.

[++]College or greater is reference category.