



The association between Food and Alcohol Disturbance (FAD), race, and ethnic identity belonging

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Abstract

Purpose A growing body of literature has established that food and alcohol disturbance (FAD: decreasing one's caloric intake in preparation for alcohol consumption) is a specific health risk that endangers health and wellbeing. Recent research on trends in FAD has revealed ethno-racial disparities. A sociological analysis is helpful to center race and examine the role of ethnic identity in reproducing health disparities. The current study is guided by theories of socialization into ideal body types by race.

Methods Study uses data from a cross-sectional survey conducted among college students. The sample includes White and Black American college students, ages 18–25, and uses ordinal logistic regression to test for the impact of race and ethnic identity on engagement in FAD using the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS).

Results FAD prevalence was lower among Black Americans than among White Americans in the sample. Results from ordered logistic regression models indicate that stronger ethnic ties reduce likelihood of FAD among Black Americans but have the opposite effect among White Americans. This modification effect provides evidence that ethnic identity belonging protects against FAD for Black Americans but acts as a risk factor for FAD among White Americans.

Conclusions Findings shed light on the documented racial disparities in FAD and weight control behavior more broadly. Ethnic identity modifies the relationship between race and FAD in our sample.

Level of evidence Level V, cross-sectional descriptive study

Keywords Alcohol use · Calorie restriction · Race · Ethnic identity · College students · Weight control behavior · Food and alcohol disturbance

Introduction

Alcohol use disorders and especially addiction and dependence constitute a major global public health problem [1]. In the US, rates of alcohol-related mortality have been rising at

an alarming rate—especially for White young-to-middle-aged adults [2]. Food and Alcohol Disturbance (FAD) (sometimes referred to as “drunkorexia” [3] and more recently “alcoholimia” [4]) involves physical exercise and/or reductions in food intake, in conjunction with alcohol consumption, to avoid weight gain and/or to facilitate the intoxication process. FAD has been described as a response to the perceived unwanted,

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or otherwise unnecessary, caloric content of alcohol [5]. Others have found that “drunkorexia” is driven by the desire to enhance or facilitate intoxication [6, 7]. These studies suggest that the dietary restriction related to alcohol intake may also be due to the desire to enhance the expected positive effects of alcohol on the person (e.g., becoming drunk more rapidly), and not only to the desire to socially conform to ideal body image norms and/or to conform to normative drinking patterns. Recent research on trends in FAD has revealed ethno-racial disparities in engagement [8]. We contribute to this area of eating and weight disorders by examining FAD in the context of race and ethnic identity.

Choquette et al. coined the term “FAD” [9]: we adopt FAD here because it is more reflective of the behaviors under study. In their theoretical frame, Choquette et al. noted that ‘drunkorexia’ translates to ‘drunk appetite’ or ‘drunk desire’ [9]. Additionally, Thompson-Memmer et al. claimed ‘drunkorexia’ has judgmental undertones and is unappealing to practitioners that are able to treat and diagnose individuals who engage in this behavior [4]. In this paper, we analyze FAD and ethnic identity in an effort to better understand race differences in FAD.

To date, we know that race differences exist in substance abuse behaviors by types of substance use [10], the severity of substance use problems [11] and racialized contexts [12, 13]. In regard to FAD, Barry and Piazza-Gardener reported that (1) students who exercise, diet, vomit, use laxatives, and/or take diet pills to lose weight were significantly more likely to engage in binge drinking and (2) Black Americans were significantly less likely to engage in binge drinking when compared to their White counterparts [5]. These findings suggest socio-cultural aspects of race may be working to shape trends in FAD. We do not know if ethnic identity, and, in particular, a sense of ethnic belonging, is associated with FAD. Following Kelly and colleagues’ recommendation that future research on body image and weight control behaviors account for “degree of acculturation” (p 332) [14], we address this gap in the literature by examining the association between ethnic belonging, race, and FAD.

Theory: race and socialization into health risk behaviors

Weight control behaviors

According to the Centers for Disease Control and Prevention, 46% of high school students have tried to lose weight in the past 12 months [15]. A look at trends by race show 45% of White American students and 41% of Black American students have engaged in weight loss behavior [15]. The CDC and Shuttlesworth and Otter also show race-based disparities across weight control techniques, with White American students engaging in more regular exercise, fasting,

vomiting, and laxative use than their Black American counterparts [15, 16].

Contextualizing these patterns involves understanding different norms around ideal body type by race. For White Americans, the desire to be slim is central to identity formation early on [17]. According to Saguy and Gruys [18] and Lovejoy [19], the dominant, or White American, culture has particular assumptions about weight that stigmatize obesity and celebrate thinness. The authors of these studies also argue that thin frames are indicative of control, desirability, and employability. For White Americans, and for non-Whites who subscribe to dominant culture, qualitative and quantitative analyses have corroborated this preference for thinness [20]. Kelly et al. examined the relationships between masculinity, body image, and race. Their results showed that White American men were more likely to express concerns about their shape, while Black American men were more likely to have a high Body Mass Index (BMI) score [14].

In terms of Black Americans, norms around body type involve a preference for fuller frames [21, 22]. Schooler et al. found a direct link between weight control behaviors, BMI scores, and television consumption among women aged 17–22 [23]. Interestingly, they also found that exposure to predominately Black American television programming protected the self-esteem of Black American women with the lowest levels of ethnic identity. They claimed that this culturally disconnected subgroup benefited from seeing diverse depictions of Black women on television. In another study, Sanderson et al. found that women attending HBCUs were less likely to dislike their body, associate slimness with quality of life, and receive positive interpersonal messages about their bodies, when compared to their Black American counterparts at predominately-White institutions [24].

Alcohol consumption

Alcohol consumption is another health risk behavior with racialized trends in use. According to the CDC, heavy episodic drinking behavior (HED) involves consuming five or more drinks per sitting for men and four or more drinks per sitting for women [25]. Their report shows 21% of White Americans and 14% of Black Americans engage in HED four or more times per month.

Research on socio-cultural aspects of White race, known as whiteness, points to several promoters of HED behavior. First, on average, White Americans have higher socioeconomic status (SES), measured via income and education, when compared to their Black American counterparts [26]. This can promote heavy consumption of alcohol as it is costly, more prevalent among higher SES adolescents, and most occurs in affluent contexts like college campuses, vacations, and restaurants [27, 28]. Second, aspects of White masculinity sometimes work to promote HED. For one, there

is evidence that alcohol consumption is a tool used by White male college students to establish their dominance and differentiate themselves from non-drinkers [29]. Second, it provides an excuse to exude vulnerability and fragility, which are socially unacceptable when men are sober [30]. Finally, Wade examined HED behaviors in a sample of Black and White emerging adults and found that White Americans were significantly more likely to engage in this behavior, and even more so if they were male, identified as masculine, and working full-time [31].

Research on race and racism reveals barriers to consumption unique to Black Americans. First, there is evidence that Black Americans have a turbulent relationship with law enforcement [32–34]. As a result, preconceptions about the mishandling of Black Americans spill over to HED behavior and Black Americans avoid public drunkenness out of fear of police bias [35–37]. Second, there is also evidence that family socialization practices work to detour Black Americans from engaging in HED. Leavell et al. found that Black Americans (especially fathers) connect their children with more adult care providers (e.g., extended family) [38], which has been shown to protect children from engaging in risk behaviors [39]. Second, Clark et al. found that authoritarian approaches to child-rearing (low acceptance, high control) are more prevalent in Black families, which may impact the likelihood of HED [40].

Given the extant literature on race and ethnic differences in FAD, alcohol use, and body-type ideation, we hypothesize:

H1 White Americans will be more likely to engage in HED compared to Black Americans.

H2 White Americans will be at higher risk for FAD than their Black American counterparts.

H3 Ethnic Identity Belonging will be a protective factor against FAD.

Methods

Procedure and participants

Data were collected using a web-based survey fielded during fall 2013 and spring 2014. The sampling frame consisted of students at least 18 years of age enrolled in introductory sociology classes at a medium-sized Midwestern University. Data collection was approved by the University's Institutional Review Board. Respondents were asked detailed questions regarding a range of health behaviors, including FAD, as well as questions regarding ethnic identity that are

essential toward addressing the hypotheses posited in the previous section.

Of the 2327 students comprising the sampling frame, 1026 completed the survey for an overall response rate of 44.09%. Incomplete survey records ($n=23$), respondents older than 25 ($n=162$), respondents who indicated use of a fictitious drug ($n=19$) [41], respondents who indicated no alcohol consumption (i.e., abstainers) ($n=245$), and respondents who did not provide answers to FAD items ($n=16$) were removed prior to analyses. Respondents who identified as neither Black nor White were also removed from the data set. The final subsample ($n=573$) consists of self-identifying Black and White respondents between ages 18 and 25 who indicated consuming alcohol and provided responses to the outcome measure.

Measures

FAD

FAD is measured using the 21-item Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS) [42]. Respondents were asked to rate the extent to which they engage in 21 weight control and alcohol consumption behaviors during the past three months. Response options included “Never”, “Rarely (about 25% of the time)”, “Sometimes (about 50% of the time)”, “Often (about 75% of the time)”, and “All of the time”. The items load well onto a single factor and the construct is internally consistent ($\alpha=0.95$), consistent with past research [42, 43].

Responses to these items were summed to create a total value for each respondent. Since a large proportion of the final sample indicated never engaging in any of the 21 FAD behaviors asked about in the scale, the variable was recoded into three distinct categories. This ordinal variable reflects responses indicating never engaging in the behaviors, rarely engaging in the behaviors, and engaging in behaviors regularly.

Ethnic identity belonging

Ethnic identity belonging is measured using the four-item belonging subscale of the Multigroup Ethnic Identity Measure scale (MEIM) [44], widely used to measure ethnic identity across ethno-racial groups [45, 46]. Respondents were asked to rate their agreement with each item using a five-point Likert scale. Responses were first summed, then divided by the total number of items to create a single measure reflecting the mean response to items in the scale. Consistent with previous research [46], the scaled items demonstrate high internal consistency ($\alpha=0.91$) and load well onto a single factor.

Behavioral and psychological covariates

Analyses incorporated measures of cigarette smoking (smoker = 1), use of other illicit drugs (other drugs = 1), and heavy episodic drinking (any HED during past 2 weeks = 1). HED was defined as consuming four or more drinks during the past 2 weeks for females and five or more for males. Friends' use of illicit drugs was also included, measured using a three-level indicator. Employment was captured using a four-level measure ("none" to "full time"). Religious attendance was measured using responses to the question, "Do you attend religious services?" (yes = 1). The Center for Epidemiological Studies Depression Scale (CES-D) [47] was included in analyses to hold constant any potentially confounding effects of respondent depression (0–21).

Demographics

Respondent race is measured dichotomously (White = 1; Black = 0). Respondent sex is measured dichotomously (male = 1; female = 0). Respondents' parent education is measured using the level of education achieved by parent with the highest education level (0–4). Age of respondent (18–25) is also included. A dichotomous indicator of respondent sexuality (sexual minority = 1) is incorporated. Whether a student lives off-campus is measured dichotomously (off-campus = 1).

Analytic strategy

All analyses were conducted using STATA 13. Variable inspection did not reveal patterns in missing-ness. Multiple imputation was performed to handle independent variables with missing data using chained equations (ICE), an iterative method equipped for handling different types of variables [48, 49]. Models handling missing data through list-wise deletion produced similar results and are available upon request.

Bivariate correlations were computed prior to multivariate analysis to guide model construction. Variables were selected for inclusion in multivariate models based on their performance in preliminary bivariate correlation analyses as well as their theoretical importance in explaining the relationships between ethnic identity, race, and FAD.

Ordinal logistic regression models were constructed to test the impact of ethnic identity belonging and race on FAD, holding constant the effects covariates and controls. Predicted probability charts were generated to probe the role of ethnic identity in the relationship between race and FAD.

Results

The total sample ($n = 573$) was predominantly female (61.0%, $n = 349$) and White (84.1%, $n = 484$). Participants had a mean age of 19.82. Regarding FAD, the largest number of participants fell into the "None" category (45.8%, $n = 262$), while the smallest number fell into the "Regular" category (13.1%, $n = 75$). The mean score for the ethnic identity belonging scale was 2.4. Descriptive statistics for all model variables are provided in Table 1.

Bivariate analysis

Bivariate relationships were examined to test hypothesis 1 and to assess initial support for inclusion of variables in multivariate models. Table 2 indicates differences between Black and White respondents in median level of FAD, mean score on the ethnic identity belonging scale, and prevalence of HED. On average, Black respondents reported higher levels of ethnic identity belonging (2.83 compared to 2.33 among Whites; one-way ANOVA $p < 0.001$). This, in addition to a negative correlation between being White and ethnic identity ($r = -0.021$, $p < 0.05$) supports the notion that Blacks have a higher overall sense of ethnic identity belonging in comparison to Whites, consistent with prior studies that have reached similar conclusions [50, 51]. White respondents reported higher levels of FAD than Black respondents. A greater proportion of White respondents reported HED (54.68% as compared to 45.98%). Subsequent significance tests (Kruskal–Wallis H and Chi-square) found no statistical significance between White and Black respondents in these behaviors.

Differences between female and male respondents were also examined among key variables. Males reported higher mean levels of ethnic identity belonging (2.52 compared to 2.33; one-way ANOVA $p < 0.01$) and higher prevalence of HED (61.99% compared to 47.84%; Chi-square $p < 0.001$). Factorial ANOVA testing the main and combined effects of respondent race and sex confirmed the above findings and suggested a significant interaction between sex and race in reported FAD ($p < 0.01$). Results from this analysis of respondent sex are available upon request from the authors.

Multivariate analysis

All three regression models are displayed in Table 3.

Model 1 tests the impact of model covariates and controls excluding ethnic identity belonging. In this model, smoking

Table 1 Sample characteristics

	Mean (SD) or %
FAD (CEBRACS)	
None	45.84
Rarely	38.37
Regular	13.07
Male (vs. female)	38.99
Parent education	
Less than HS	1.40
Completed HS	12.57
Some college	27.92
College graduate	35.95
Graduate/professional degree	21.64
White (vs. Black)	84.47
Age	19.82 (1.79)
Sexual minority	6.47
Lives off-campus	61.40
Employment	
None	33.86
Up to 20 h	37.52
21–39 h	22.86
Full time	5.58
Attends religious services	50.09
CESD scale	8.68 (4.42)
Smoker	8.04
Other drug use	38.44
Friend substance use	
Low	30.02
Medium	27.57
High	36.30
HED	53.96
Ethnic identity	2.40 (0.84)

Table 2 Differences between Black and White respondents on key variables

	Black respondents (median, mean/SD, or %)	White respondents (median, mean/SD, or %)	Range
FAD	Never (1)	Rarely (2)	1–3
Ethnic identity*	2.83 (0.72)	2.33 (0.83)	0–4
HED	45.98	54.68	0–1

*Difference is statistically significant

(OR: 0.52, 95% CI 0.27–0.99, $p < 0.05$), heavy episodic drinking (OR: 4.62, 95% CI 3.14–6.80, $p < 0.001$), and other drug use (OR: 1.55, 95% CI 1.08–2.23, $p < 0.05$) were significantly associated with FAD. Model 2 introduces ethnic identity into the equation, which fails to reach significance at the 0.05 level. In this model, HED (OR: 4.62, 95% CI

3.14–6.80, $p < 0.001$) and other drug use (OR: 1.56, 95% CI 1.09–2.25, $p < 0.05$) retain significance.

Model 3 introduces the multiplicative interaction term between race and ethnic identity, while continuing to hold constant the effects of all other model variables. The interaction term significantly predicts FAD (OR: 2.15, 95% CI 1.07–4.32, $p < 0.05$). For Black respondents, a one-unit increase on the ethnic identity belonging scale (i.e., from “None” to “Rarely” or from “Rarely” to “Regular”) reduces the odds of engaging in increased levels of FAD by approximately 46%. Conversely, for White respondents, a one-unit increase on the ethnic identity belonging scale increases the odds of engaging in increases in FAD by 16.1%. As in Model 2, the impact of ethnic identity on FAD fails here to reach significance. HED (OR: 4.53, 95% CI 3.07–6.67, $p < 0.001$) and other drug use (OR: 1.56, 95% CI 1.08–2.25, $p < 0.05$) remain significant.

Incorporation of the interaction term in Model 3 reveals that ethnic identity has a drastically different effect on FAD when comparing White and Black respondents. Specifically, high levels of ethnic identity belonging reduce the odds of engaging in higher levels of FAD among Black respondents yet increase odds of engaging in higher levels of FAD for White respondents. The main effect of the relationship between ethnic identity belonging and FAD is not statistically significant in Models 2 and 3 due to crossover moderation.

Figure 1 displays changes in the probability of engaging in each level of FAD across ethnic identity among Black and White respondents separately. The first graph demonstrates that a higher sense of ethnic identity among Black respondents increases the likelihood of never engaging in any FAD, whereas the opposite is true for White respondents. The second and third graphs the opposite effect. That the crossover interaction in the first level of the outcome variable shows the sharpest contrast between Black and White respondents suggests that ethnic identity belonging has the largest impact on the relationship between race and an individual’s total avoidance of FAD, as compared to occasional or regular FAD.

Discussion

Informed by theories of socialization into health risk behaviors by race, the current study tested the importance of both ethnic identity belonging and race in predicting FAD. As anticipated in hypotheses 1 and 2, White American students had greater rates of HED behavior and a higher prevalence of FAD than their Black American counterparts. The study also hypothesized that respondents reporting higher levels of ethnic identity belonging would be less likely to engage

Table 3 Ordered logistic regression models

	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Male	0.76 (0.53, 1.08)	0.75 (0.52, 1.07)	0.75 (0.52, 1.07)
Parent education	1.06 (0.90, 1.26)	1.06 (0.90, 1.25)	1.06 (0.90, 1.26)
White (vs. Black)	1.35 (0.82, 2.24)	1.40 (0.84, 2.33)	0.17 (0.02, 1.22)
Age	1.00 (0.89, 1.12)	1.00 (0.90, 1.12)	1.02 (0.91, 1.14)
Sexual minority	1.79 (0.92, 3.48)	1.83 (0.93, 3.58)	1.80 (0.92, 3.52)
Lives off-campus	0.94 (0.63, 1.41)	0.94 (0.63, 1.41)	0.92 (0.62, 1.37)
Employment	1.07 (0.86, 1.32)	1.06 (0.86, 1.32)	1.06 (0.85, 1.31)
Attends religious services	1.17 (0.83, 1.66)	1.15 (0.81, 1.63)	1.15 (0.81, 1.64)
CESD scale	1.03 (0.99, 1.07)	1.03 (0.99, 1.07)	1.03 (0.99, 1.07)
Smoker	0.52 (0.27, 0.99)*	0.52 (0.27, 1.00)	0.54 (0.28, 1.03)
Other drug use	1.55 (1.08, 2.23)*	1.56 (1.09, 2.25)*	1.56 (1.08, 2.25)*
Friend substance use	1.24 (0.98, 1.57)	1.24 (0.98, 1.57)	1.23 (0.97, 1.56)
HED	4.62 (3.14, 6.80)***	4.62 (3.14, 6.80)***	4.53 (3.07, 6.67)***
Ethnic identity	–	1.07 (0.87, 1.33)	0.54 (0.28, 1.05)
White × ethnic identity	–	–	2.15 (1.07, 4.32)*
Threshold 1	1.73***	1.91***	0.01
Threshold 2	4.01***	4.19***	2.31*

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

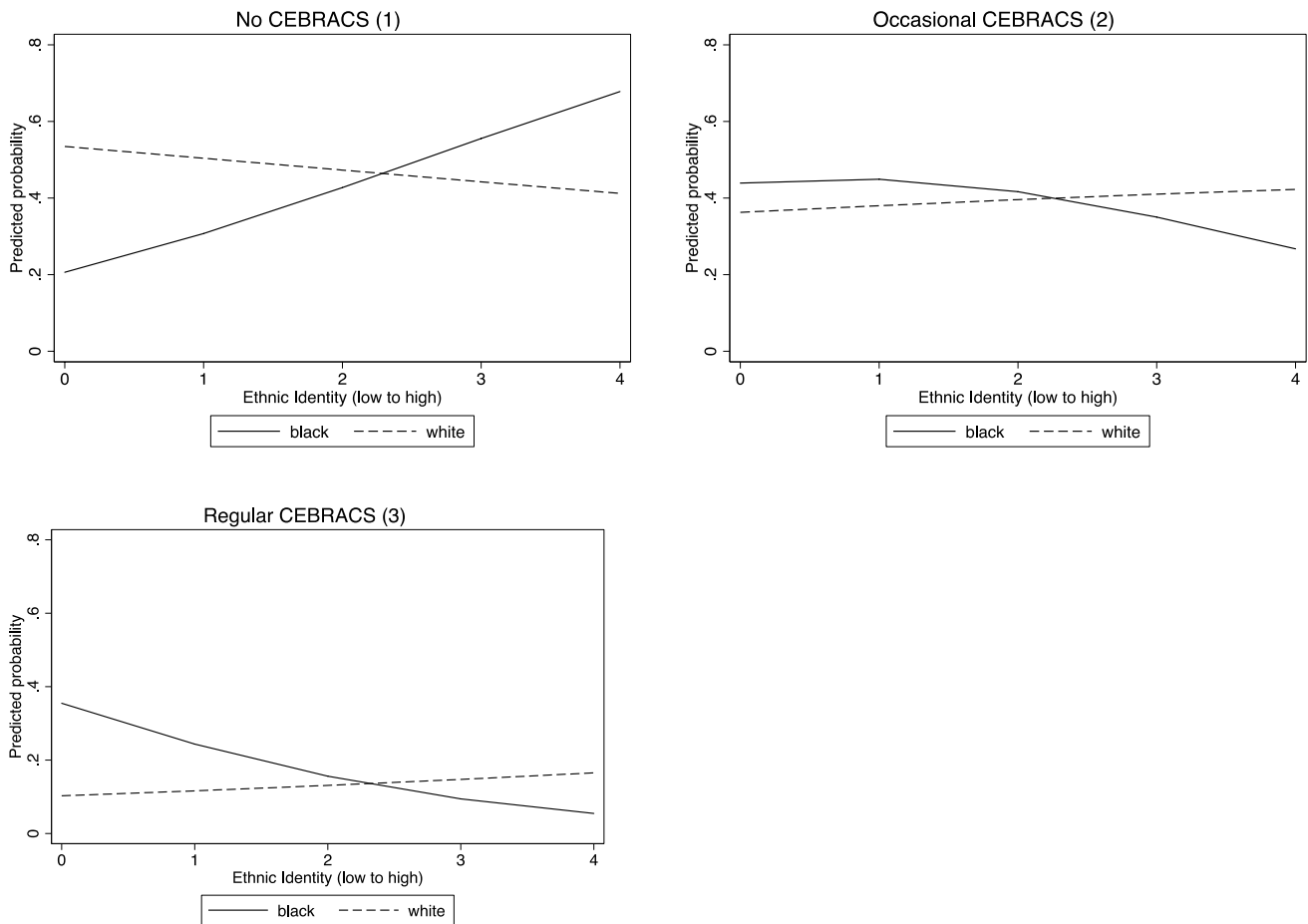


Fig. 1 Predicted probability of each level of FAD dependent variable (CEBRACS) across ethnic identity by race

in FAD. This hypothesis was partially supported in analytic models.

Results from the multivariate models reveal that ethnic identity belonging exerts either a positive or a negative effect on FAD, depending on whether the respondent is Black or White. Black students with higher levels of ethnic identity were more likely to report not engaging in FAD than those with lower levels of ethnic identity. Among White students, however, those with higher levels of ethnic identity were less likely to report not engaging in FAD than their counterparts with lower ethnic identity. This modification effect occurred at all levels of the outcome measure, suggesting that ethnic identity belonging is both a protective and a risk factor for FAD, depending on whether the respondent is Black or White.

This differential impact makes intuitive sense given race-related differences in the socialization into ideal body types. On one hand, for White Americans, alignment with ethnicity and norms around ideal body types comes with pressure to maintain a thin frame. Additionally, socio-cultural aspects of Whiteness result in this group experiencing weight-related discrimination at greater rates than other race groups. On the other hand, for the majority of Black Americans, socio-cultural aspects of race experience have led to group-specific ideals regarding body types and an acceptance or preference for larger frames. There is an abundance of literature showing that, regardless of body size, Black American women have higher levels of body satisfaction than their White American counterparts [19, 52]. Black Americans have been shown to have diets higher in fats and calories [53], to use eating to cope with racism [20], to binge eat in response to parent and peer body shaming [54], to live in fast food-dense food deserts [55], and face structural barriers to exercise [56]. Perhaps this specific racialized social context informs the findings of this study.

These findings also fit into existing theories on race, ethnicity, and alcohol consumption. The finding that ethnic pride promotes FAD among White Americans strengthens findings on the interrelated nature of engagement in HED and White culture in America. It also adds to the emerging literature on immigration status and alcohol abuse. To date, studies with predominately-White samples have shown that immigrant adolescents are less likely to abuse alcohol when compared to native and second-generation youth, especially when their country of origin has lower drinking rates [57]. Additionally, there is evidence that cognitive reappraisal (or the ability to process and modify the impact of emotional situations) affects the relationship between nativity and drinking patterns in immigrants exclusively [58]. It could be that deeper pride in White American culture is more prevalent among native-born White American young adults. We urge future scholars to test for rates of ethnic pride in White Americans by nativity status. It is also worth

noting that work on nativity is largely limited to White samples in the US. This is because Black Americans are unable to adopt drinking styles from their country of origin. They also have structural disadvantages that limit their access to 'true' native status and in turn, the resources needed to drink heavily.

This study does contain several limitations that create opportunities for future research. First, we utilized a web-based survey to sample a college population from a single university which limits generalizability. While the racial breakdown of our sample is fairly representative of the overall university's population, future research should be conducted with a more racially diverse sample by oversampling ethnic and racial minorities. Second, our study lacks relevant control variables that may impact on FAD, including self-reported measures of weight, body mass index, or participants' perceptions of their own body image. FAD may also be motivated by other factors that we did not account for, such as a desire to enhance the positive effects of alcohol use, rather than a desire to conform to weight norms [6, 7]. Additionally, religiosity and familial norms may shape attitudes around drinking for Black Americans. Future studies need to account for the different motives that individuals may have for engaging in this behavior. Finally, we provided a brief analysis that examines sex differences in FAD. Future research should further examine this relationship, as recent studies indicate sex differences and gender orientation play a significant role in FAD [43, 59].

Some practical implications for our findings include the need for health professionals to inquire about eating disturbance for patients presenting with alcohol disorders and vice versa. Practitioners should remind patients that achieving thinness can present its own risks, especially if alcohol is being used as part of a weight loss strategy. Practitioners should also be cognizant of race and ethnic differences in how eating and alcohol disorders are manifested. Our results suggest ethnic identity is protective for racial minorities but not for whites. We note, however, that in the United States minorities experience racism, sexism, misogyny, homophobia, and transphobia. These experiences have indirect effects (e.g., through segregation and stress) and direct effects (e.g., through inequitable distribution of medical resources) on health and mental health. Therefore, intersecting identities need to be taken into consideration.

Conclusion

To conclude, this study shows that while FAD is of concern for young adults [59, 60], they are acutely of concern for White Americans with high levels of racial-ethnic pride compared to Black Americans with high levels of racial-ethnic pride. In this case, Black Americans' preference for

larger frame comes with the latent benefit of protection from FAD. This outcome reveals a public health concern because White American culture is the dominant culture and young adults are inundated with images of thinness and binge drinking on all media platforms. Given the health-related costs of FAD, it is important for bio-psycho-social research to focus on ways to promote healthy eating and the risks of social drinking to young adults. Future research should consider including gender identity and sexuality in the analysis of FAD given differences in substance use, body image concerns, and weight control behavior by gender identity and sexuality. In closing, we now know that eating and weight disorders coincide with alcohol use disorders. Understanding these phenomena from an intersectional approach holds promise for prevention and treatment.

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Compliance with ethical standards

Conflicts of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from all individual participants included in the study.

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