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# Prevalence of Disordered Eating Behaviors Among Sexual and Gender Minority Youth Varies at the Intersection of Gender Identity and Race/Ethnicity

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## ABSTRACT

**Objective:** Prior work has documented inequities in disordered eating behavior (DEB) prevalence across gender identity, race, and ethnicity, yet has often ignored the fact that individuals belong to multiple social groups simultaneously. The present study assessed DEB inequities at the intersection of gender identity and race/ethnicity.

**Method:** The sample included *n* = 10,287 adolescents (68% gender-diverse, 33% belonging to marginalized racial/ethnic groups). Past-year prevalence of dietary restriction, self-induced vomiting, diet pill use, and binge eating was assessed. Data were analyzed with multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA). MAIHDA nests individuals within social strata defined by all combinations of gender identity and race/ethnicity (a proxy for exposure to structural (cis) sexism and racism). MAIHDA allows for comparison of outcome prevalence across strata and identifies strata with disproportionately high or low prevalence.

**Results:** Hispanic gender-nonconforming youth had a high prevalence of multiple DEBs: restricting prevalence was 67.1% (95% CI [62.1%–72.2%]), vomiting prevalence was 25.9% (95% CI [21.6%–31.0%]), and binge eating prevalence was 46.0% (95% CI [40.2%–51.4%]). For all outcomes, at least one stratum had disproportionately low prevalence; for all outcomes except vomiting, at least one stratum had disproportionately high prevalence, indicative of intersectional interactions between gender identity and race/ethnicity.

**Discussion:** DEB prevalence among adolescents varies substantially at the intersection of gender and race/ethnicity, with the highest prevalence among those belonging to multiple marginalized groups. Future research is needed on the multilevel drivers of DEBs.

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#### Summary

- Research often compares outcome prevalence within one identity dimension, yet people belong to multiple intersecting social groups.
- We assessed how disordered eating prevalence varies at the intersection of gender identity and race/ethnicity. This revealed a complex and nuanced intersectional patterning.
- We suggest that disordered eating risk factors across levels of influence be studied so that structurally sensitive interventions can be developed.

# 1 | Introduction

Up to 50% of adolescents experience disordered eating behaviors (DEBs; Neumark-Sztainer et al. 2002). Adolescent engagement in DEBs is concerning because DEBs predict the onset of eating disorders (EDs), depression, anxiety, and deliberate self-harm (Robinson et al. 2020; Stice and Desjardins 2018). Despite the high prevalence of DEBs in adolescents overall, marginalized groups are disproportionately affected. For example, DEBs have often been assessed among cisgender boys and girls, with cisgender girls experiencing two to eight times higher DEB prevalence compared to cisgender boys (Neumark-Sztainer et al. 2002). When viewing gender identity beyond a binary, cisgender lens, transgender and gender-diverse people experience higher DEB prevalence than cisgender boys and men and similar DEB prevalence as cisgender girls and women (Roberts et al. 2021). Across all gender groups, nonbinary and gender-nonconforming youth and young adults experience the highest DEB prevalence (Lefevor et al. 2019; Roberts et al. 2021). With respect to race and ethnicity, studies find high DEB prevalence among Asian youth (Rodgers et al. 2017) and Hispanic youth (Accurso et al. 2024; Beccia et al. 2019).

Many studies assess DEB inequities by single social positions (e.g., gender only; Lefevor et al. 2019; Roberts et al. 2021), yet people possess multiple intersecting identities that may, in combination, be associated with differential DEB prevalence. Intersectional paradigms, which stem from Black feminist scholarship's intersectionality theory (Crenshaw 1989), consider intersecting social positions to provide nuanced information about the patterning of health outcomes. Specifically, intersectionality theory proposes that health inequities arise due to interlocking systems of power, privilege, and oppression that differentially shape access to resources, opportunities, and risks within and between groups (Bowleg 2012; Crenshaw 1989; Evans et al. 2018). These interlocking systems result in health advantages for more socially privileged groups and more health disadvantages for more socially oppressed groups.

Literature is emerging linking DEB inequities to structural systems of power, privilege, and oppression. For instance, structural sexism refers to "systemic gender inequality in power and resources" (Homan 2019, p. 487) and is associated with a higher prevalence of vomiting, using laxatives, and binge eating (Beccia et al. 2022). Structural racism refers to laws, policies, practices, and norms "that produce, condone, and perpetuate widespread unfair treatment of people of color" (Braveman et al. 2022, p. 171). Structural racism is associated with a higher prevalence of using appearance and performance-enhancing drugs among Hispanic and Latinx adults (Askew et al. 2024). Structural transphobia refers to "restrictive laws/policies (e.g., permitting discrimination based on gender identity) and/or prejudicial attitudes specific to transgender populations at the geographic (e.g., state, country) level" (Price et al. 2024, p. 1). Although no studies (to our knowledge) have assessed whether structural transphobia is associated with DEBs, structural transphobia is associated with DEBs, structural transphobia is exerce past-month psychological distress (Price et al. 2024). Thus, there is precedent for structural processes relating to gendered and racialized discrimination as being potential drivers of inequities in DEB prevalence among young people.

Several studies have explored DEB prevalence at the intersection of gender and racial/ethnic identities (Beccia et al. 2019; Burke et al. 2023; Simone et al. 2022), though only two (to our knowledge) included gender-diverse people. Using the Healthy Minds Study, Gordon et al. (2024) explored the intersectional prevalence of ED symptoms among college students. They found a complex patterning of outcomes, with ED symptom prevalence being disproportionately high among Arab cisgender women and multiracial transgender women. Although this study had many strengths, only 2.5% of participants identified as transgender or gender-diverse, which reduced estimate precision for multiple marginalized subgroups. Additionally, this sample included people between age 18 and 36 years. Thus, DEB prevalence at the intersection of gender and racial/ethnic identities among adolescents is unknown.

In another study, Lawrence et al. (2024) assessed the intersectional prevalence of DEBs among > 11,000 sexual and gender minority youth from the 2017 LGBTQ National Teen Survey. Their models included the intersection of eight social positions and experiences: gender, sexual orientation, race/ethnicity, weight status, weight-based bullying victimization, bias-based bullying victimization, self-esteem, and LGBTQ pride. Transgender and gender-diverse adolescents with high body mass index who experienced weight-related bullying had particularly high DEB prevalence. While this study had multiple strengths, one limitation is that Lawrence et al. (2024) analyzed the prevalence of two composite "weight control behavior" variables: unhealthy weight control behaviors (skipping meals and using food substitutes) and extreme unhealthy weight control behaviors (selfinduced vomiting, using diet pills, laxatives, or diuretics). A gap thus exists in understanding the intersectional patterning of specific weight control behaviors. This gap is important given that some DEBs show predictive specificity for future EDs (Stice et al. 2017). Further, the landscape for LGBTQ rights and anti-LGBTQ policies changes over time (e.g., Agénor et al. 2022). The context in which the 2017 LGTBQ National Teen Survey data were collected likely does not provide a full picture of the more recent context.

The present study assessed the patterning of specific DEBs at the intersection of gender and racial/ethnic identities among a sample of sexual and gender minority youth. We used a quantitative intersectionality approach called multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA; Evans et al. 2018; Merlo 2018). Two features specific to MAIHDA make it an ideal modeling framework for the study's aims. First, MAIHDA uses a multilevel structure, where individuals are nested within social strata that are defined by combinations of social position variables. This nesting structure assumes that individuals within a given stratum are exposed to similar structural processes driving inequities, thereby operationalizing intersectionality theory's hypothesis that structural processes cause health inequities (Bowleg 2012; Crenshaw 1989). Second, MAIHDA differentiates between intersectional effects that are additive versus interactive. Briefly, additive intersectional effects assume that systems of power, privilege, and oppression lead to linear risk and resilience, such that those experiencing multiple forms of marginalization have more risk and those experiencing multiple forms of advantage have more resilience. In other words, additive intersectional effects are akin to the "total being equal to the sum of its parts." However, interactive intersectional effects essentially mean that systems of power, privilege, and oppression lead to nonlinear and synergistic risk or resilience, akin to the total being unequal to the sum of its parts. Thus, MAIHDA differentiating between additive versus interactive intersectional effects allows for the identification of subgroups with uniquely high or uniquely low outcome prevalence, which arise due to interactive effects among social positions. Taken together, MAIHDA models provide nuanced results that are in line with tenets of intersectionality theory and can help further understand the intersectional patterning of DEBs, which is an important first step toward ultimately reducing DEBs overall and reducing DEB inequities.

Aim 1 of the present study was to describe DEB prevalence among intersectional subgroups. Aim 2 was to assess the extent to which intersectional interactions between gender identity and race/ethnicity accounted for DEB prevalence—i.e., identifying groups who have uniquely high or uniquely low DEB prevalence.

## 2 | Method

## 2.1 | Participants and Procedures

Data came from the 2022 LGBTQ National Teen Survey (N=17,578). Inclusion criteria were age 13–18 years, identify as LGBTQ, live in the US, and English fluency. The Institutional Review Board approved study procedures, including waiving the requirement for parental consent. Participants were recruited through influencers across social media platforms. Participants completed a consent form and study measures on Qualtrics, and received a \$5 gift card. The team developed an extensive data screening protocol to detect and exclude invalid responses. Further methodological details are described in Watson et al. (2024). Several other studies have been published on DEBs using the 2017 LGBTQ National Teen Survey implementation (see Supporting Information and Lawrence et al. 2024; Lessard, Wang, and Waston 2021; Paceley et al. 2023; Roberts et al. 2022). The present study is the first to explore DEB outcomes using the 2022 LGBTQ National Teen Survey implementation.

The analytic sample included n=10,287. The most common reason for exclusion was participants exiting the survey before

DEBs were assessed (n = 6387; 87.6%). Other reasons for exclusion were missing data for DEBs; gender identity, or race were categorized as "something not listed;" or participants were in racial/ethnic categories that were too small to be further stratified by gender (e.g., non-Hispanic Native Hawaiian and Other Pacific Islander).

#### 2.2 | Measures

#### 2.2.1 | Gender Identity

Participants were asked, "What is your current gender identity?" Response options were cisgender boy/male, cisgender girl/female, transgender boy/male, transgender girl/female, nonbinary, gender queer, gender fluid, gender-nonconforming, questioning, or another gender identity. Participants selected all responses that applied. Those who selected "another gender identity" were asked to write in their gender. If participants wrote in a gender identity that matched existing options, they were coded as that existing option. If participants selected multiple responses, a follow-up question asked if they could only choose one gender, which identity most closely matches their current gender. Those who selected one gender identity from this question were coded as such. Those who did not select a single gender identity or wrote in multiple identities were coded as "something not listed."

Due to small subgroup sample sizes, we combined into a single "gender-nonconforming" category participants whose gender identity was gender queer, gender fluid, or gendernonconforming, so that this group could be further stratified by race/ethnicity.

#### 2.2.2 | Race/Ethnicity

Participants were asked "What is your race?" (response options: American Indian or Alaska Native, Asian, biracial or multiracial, Black or African American, Native Hawaiian or Other Pacific Islander, White, and another race) and "Are you Hispanic or Latina/e/o/x?" (response options: yes, no). We recoded these two items into a single variable, where those identifying as Hispanic or Latina/e/o/x were coded as Hispanic, regardless of race. The sample sizes for non-Hispanic American Indian or Alaska Native and non-Hispanic Native Hawaiian or Other Pacific Islander were too small to be further stratified by gender, and as such we excluded these groups from analyses. Further, given the heterogeneous nature of the "another race" category, we also excluded this group. Finally, we note that these racial/ ethnic categories take on meaning related to health due to racism (a process called "racialization"; Bernard and Daniel 2015).

## 2.2.3 | Outcomes

The survey assessed four individual DEB outcomes: restricting, self-induced vomiting, using diet pills, and binge eating. Restricting, vomiting, and diet pills were assessed with three questions, all with the same stem and response options: "In the last year, have you [eaten very little, made yourself throw up, or used diet pills] in order to lose weight or keep from gaining weight?" Response options were never, rarely, sometimes, or often. Restriction was recoded into the following categories (1) never or rarely and (2) sometimes or often. Vomiting and using diet pills were also recorded, though categories were (1) never and (2) rarely, sometimes, or often. We adopted this coding scheme given that vomiting and using diet pills are more extreme behaviors than restrictions.

Binge eating was assessed with two questions. The first was "In the past year, have you ever eaten so much food in a short period of time that you would be embarrassed if others saw you binge eating?" Response options were yes or no. If participants answered yes, they were asked "During the times when you ate this way, did you feel you couldn't stop eating or control what or how much you were eating?" Response options were yes or no. Binge eating was coded as present if participants reported both eating a large amount of food and loss of control.

# 2.3 | Data Analytic Plan

Data were analyzed using MAIHDA (Evans 2019; Evans et al. 2018), where we used two-level Bayesian multilevel logistic regression models with individuals (Level 1) nested within social strata (Level 2). We included 35 social strata, based on all combinations of gender identity and race/ethnicity.

Two MAIHDA models were run for each outcome. First, the intersectional prevalence model included random intercepts for the social strata and no main effects. Two parameters were estimated: (1) the variance partition coefficient (VPC), which is the proportion of outcome variance attributable to between-strata differences, and (2) stratum-specific predicted prevalence estimates, which allow for comparisons among strata.

Second, the intersectional interaction model maintained random intercepts for social strata and added main effects for gender and race/ethnicity. Main effects allow for the differentiation between additive versus intersectional interaction effects (e.g., see Evans et al. 2024). Three parameters were estimated: the VPC (now adjusted for the main effects of gender and race/ethnicity), the proportional change in variance (i.e., the portion of the intersectional prevalence model's VPC attributable to additive intersectional effects), and stratum-specific excess prevalence due to interaction estimates (hereafter referred to as excess prevalence) and associated 95% credible intervals (CI). If the 95% CI for a given stratum's excess prevalence estimate does not contain 0, excess prevalence is significantly different from what would be expected based on additive effects alone and is evidence for intersectional interaction effects. The sign of the excess prevalence estimate (positive vs. negative) indicates whether prevalence is higher versus lower than expected. This parameter identifies strata with uniquely high or uniquely low prevalence.

Analyses were conducted in R (R Core Team 2021) using brms (Bürkner 2017). Weakly informative priors were specified for all parameters. For each outcome, the intersectional prevalence model included a burn-in period of 5000 iterations and 10,000 total iterations. The intersectional interaction model included

638

a burn-in period of 5000 iterations and 20,000 total iterations. Visualizations were made with ggplot2 (Wickham 2016). Full details of the Bayesian analysis are provided in the Supporting Information.

# 3 | Results

Table 1 shows sample sociodemographic characteristics and observed outcome prevalence. Social strata sample sizes ranged from 16 to 1448 (mean = 293) and are shown in Table S1.

# 3.1 | Intersectional Prevalence Models

In the intersectional prevalence models, VPCs ranged from 2.99% (vomiting) to 5.85% (diet pills; Table 2), indicating that roughly 3%–6% of the variance in outcome prevalence is due to differences between strata. Stratum-specific predicted prevalence estimates for all outcomes are shown in Figures 1 and 2 and Table S1. These estimates varied across strata: 40.2%–67.1% for restricting, 11.0%–26.4% for vomiting, 3.4%–14.6% for using diet pills, and 24.7%–46.0% for binge eating.

The three groups with the highest predicted prevalence for restricting, vomiting, and binge eating were Hispanic, Black, or multiracial transgender boys, youth questioning their gender, and gender-nonconforming youth. Notably, all three groups with the highest predicted prevalence of binge eating included Hispanic youth. On the other hand, White cisgender boys, Asian cisgender boys, and Asian cisgender girls were among the three groups with the lowest predicted prevalence for restricting, vomiting, and binge eating. The three groups with the highest predicted prevalence of using diet pills were Hispanic cisgender boys, Black cisgender boys, and Black transgender boys.

Across racial/ethnic groups, transgender boys had higher restricting predicted prevalence compared to cisgender boys, cisgender girls, and transgender girls. Most of these differences were statistically significant. However, there were also important differences within racial/ethnic groups by gender identity. Among Hispanic youth, gender-nonconforming youth had a significantly higher predicted prevalence of restricting, vomiting, and binge eating than transgender girls. Among White youth, transgender boys had a significantly higher predicted prevalence of (1) vomiting compared to youth of all other gender identities, (2) diet pill use compared to transgender girls, and (3) binge eating compared to transgender girls and cisgender boys. DEB prevalence did not significantly vary by gender identity for youth who were Asian, Black, or multiracial.

## 3.2 | Intersectional Interaction Models

The main effects for gender identity and race/ethnicity in the intersectional interaction models are shown in Table 2. Though some odds ratios were statistically significant, all correspond to small effect sizes (Chen, Cohen, and Chen 2010). VPCs in the intersectional interaction models ranged from 0.18% (vomiting) to 0.64% (diet pills) while the proportional change in variance values ranged from 87.32% (restricting) to 94.05% (vomiting). Such

		Restricting, n=10,287	Vomiting, <i>n</i> = 10,220	Using diet pills, <i>n</i> =10,251	Binge eating, $n = 10,266$
	N (%)	n (%)	n (%)	n (%)	n (%)
Gender identity					
Cisgender boy	1685 (16.38)	710 (42.14)	266 (15.79)	145 (8.61)	438 (25.99)
Cisgender girl	1604 (15.59)	863 (53.8)	295 (18.39)	115 (7.17)	596 (37.16)
Transgender boy	2100 (20.41)	1314 (62.57)	565 (26.9)	140 (6.67)	875 (41.67)
Transgender girl	861 (8.37)	399 (46.34)	113 (13.12)	30 (3.48)	240 (27.87)
Gender nonconforming	1602 (15.57)	955 (59.61)	358 (22.35)	95 (5.93)	650 (40.57)
Nonbinary	1752 (17.32)	1033 (57.97)	369 (20.71)	117 (6.57)	651 (36.53)
Questioning	678 (6.59)	401 (59.14)	130 (19.17)	45 (6.64)	258 (38.05)
Racial and ethnic ide	ntity				
Asian, non-Hispanic	419 (4.07)	185 (44.15)	52 (12.41)	19 (4.53)	105 (25.06)
Black, non-Hispanic	446 (4.34)	255 (57.17)	106 (23.77)	53 (11.88)	136 (30.49)
Hispanic	1752 (17.03)	1039 (59.30)	406 (23.17)	190 (10.84)	716 (40.87)
Multiracial, non-Hispanic	806 (7.84)	443 (54.96)	174 (21.59)	53 (6.58)	273 (33.87)
White, non-Hispanic	6889 (66.97)	3753 (54.48)	1358 (19.71)	372 (5.40)	2478 (35.97)
Age (years)					
13	654 (6.36)	370 (56.57)	164 (25.08)	32 (4.89)	286 (43.73)
14	1359 (13.21)	779 (57.32)	315 (23.18)	89 (6.55)	525 (38.63)
15	2016 (19.60)	1191 (59.08)	448 (22.22)	112 (5.56)	747 (37.05)
16	2312 (22.47)	1288 (55.71)	479 (20.72)	149 (6.44)	872 (37.72)
17	2386 (23.19)	1264 (52.98)	426 (17.85)	170 (7.12)	805 (33.74)
18	1585 (15.41)	783 (49.40)	265 (16.72)	135 (8.52)	473 (29.84)

TABLE 1	Sociodemographic characteristics and	observed prevalence of disor	dered eating behaviors an	d body image for the ful	ll analytic sample.
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*Note:* For the *N* (%) column, the denominator = 10,287, as this is the largest sample size available for the outcomes. For the item-specific columns, *n* and % represent the number/proportion of people with the outcome present; the denominator is given by the corresponding row's *N* for the given gender identity, racialized identity, or age. Also note the following brief explanations of the gender identities included in the present study. Cisgender boys' and cisgender girls' gender identity and transgender girls' gender identity and transgender girls' gender identity aligns with their sex assigned at birth. Transgender boys' and transgender girls' gender identity aligns with ambrella term for those who do not follow gender stereotypes, or who expand ideas of gender expression or gender identity' (PFLAG 2024). Nonbinary "refers to people who do not subscribe to the gender binary. They might exist between or beyond the man-woman boundary" (PFLAG 2024). People who are questioning their gender identity "are in the process of discovery and exploration about their...gender identity, gender expression, or a combination thereof" (PFLAG 2024). Finally, please note that in the present study, the gender nonconforming group includes youth whose gender identity is gender fluid, gender queer, or gender nonconforming. Someone who is gender fluid is "a person who does not identify with a single fixed gender or has a fluid or unfixed gender identify" (Human Rights Campaign n.d.). Gender queer people "reject notions of static categories of gender and embrace a fluidity of gender identity... People who identify as gender queer may see themselves as being both male and female, neither male or female or as falling completely outside these categories" (Human Rights Campaign n.d.).

values indicate that while additive intersectional effects account for much of the patterning in DEB prevalence, at least some variance is accounted for by interactive intersectional effects.

Across outcomes, there were one to seven strata (2.9%–20.0% of strata) that showed evidence of intersectional interactive effects—i.e., groups whose predicted prevalence estimates were significantly different than what would be expected from additive effects alone (Figure 3 and Table 2). For all outcomes, there

was at least one stratum that had a uniquely low prevalence. For all outcomes except vomiting, there was at least one stratum that had a uniquely high prevalence. For example, restricting predicted prevalence was higher for multiracial transgender boys but lower for Hispanic transgender boys than what would have been expected based on the additive effects alone. Hispanic cisgender boys and White transgender boys had a higher predicted prevalence of using diet pills and binge eating than what would have been expected based on additive effects alone.

TABLE 2		Multilevel analysis of individual	heterogeneity and disc	riminatory accuracy model summaries.
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	Restricting (%)	Vomiting (%)	Using diet pills (%)	Binge eating (%)
Intersectional prevalence model				
Variance partition coefficient	3.32	2.99	5.85	3.18
Intersectional interaction model				
Variance partition coefficient	0.43	0.18	0.64	0.49
Proportional change in variance	87.32	94.05	89.70	84.93
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Gender identity				
Cisgender boy (reference)	_	_		
Cisgender girl	1.53 (0.97, 2.47)	0.71 (0.41, 1.28)	0.01 (0.00, 0.04)	1.11 (0.69, 1.82)
Transgender boy	1.42 (1.09, 1.80)	1.13 (0.86, 1.43)	0.90 (0.63, 1.34)	1.60 (1.24, 2.03)
Transgender girl	2.09 (1.61, 2.66)	1.80 (1.40, 2.24)	0.81 (0.57, 1.14)	1.84 (1.45, 2.41)
Gender nonconforming	1.16 (0.86, 1.49)	0.79 (0.57, 1.04)	0.42 (0.27, 0.67)	1.13 (0.84, 1.53)
Nonbinary	1.89 (1.45, 2.42)	1.45 (1.14, 1.85)	0.74 (0.51, 1.10)	1.83 (1.39, 2.35)
Questioning	1.78 (1.39, 2.28)	1.32 (1.05, 1.61)	0.81 (0.55, 1.17)	1.58 (1.22, 2.06)
Racial and ethnic identity				
Asian, non-Hispanic	0.71 (0.55, 0.91)	0.60 (0.43, 0.83)	0.79 (0.49, 1.28)	0.65 (0.49, 0.90)
Black, non-Hispanic	1.17 (0.94, 1.47)	1.29 (1.00, 1.64)	2.24 (1.53, 3.23)	0.82 (0.64, 1.07)
Hispanic	1.26 (1.08, 1.51)	1.23 (1.02, 1.47)	2.09 (1.61, 2.64)	1.29 (1.06, 1.56)
Multiracial, non-Hispanic	1.00 (0.82, 1.22)	1.09 (0.87, 1.32)	1.23 (0.86, 1.73)	0.92 (0.74, 1.16)
White, non-Hispanic (reference)	_	_	_	—
Age	0.96 (0.93, 0.98)	0.92 (0.89, 0.95)	1.11 (1.04, 1.18)	0.93 (0.91, 0.96)

*Note:* The intersectional prevalence models estimate only a variance partition coefficient (VPC). The intersectional interaction models estimate VPC, proportional change in variance, ORs for each gender identity (reference = cisgender boy), ORs for each racialized identity (reference = White, non-Hispanic), and OR for age. Gender nonconforming includes people whose gender identity is gender fluid, gender queer, or gender nonconforming.

## 4 | Discussion

This study examined how DEB prevalence varies at the intersection of gender and racial/ethnic identities among sexual and gender minority youth. Our analytic approach uniquely allowed for (1) comparison of DEB prevalence within and between intersectional subgroups and (2) quantification of additive versus interactive intersectional effects of gender identity and racial/ ethnic identity on the social patterning of DEBs.

Examining outcomes across groups defined by one dimension of social identity artificially simplifies a complex reality; intersectional approaches come closer to capturing such complexity. For example, Table 1 shows the observed restricting prevalence by gender alone and by race/ethnicity alone. One may infer that since the highest single-axis restricting prevalence was observed for (1) transgender boys and (2) Hispanic youth, Hispanic transgender boys would be the intersectional group with the highest restricting prevalence. However, our intersectional results do not support such an inference. In fact, while Hispanic transgender boys had relatively high restricting predicted prevalence, this estimate was significantly lower than what would have been expected based on additive effects alone. Indeed, every outcome showed group had uniquely high or uniquely low prevalence, given their intersecting identities. This pattern of results was nuanced. Across all outcomes, there were three instances where strata including transgender boys had uniquely higher than expected prevalence: multiracial transgender boys had a higher prevalence of restricting, and White transgender boys had a higher prevalence of using diet pills and binge eating. At the same time, there were two instances where strata including transgender boys had uniquely lower than expected prevalence: Hispanic transgender boys had lower restricting prevalence and multiracial transgender boys had lower prevalence of using diet pills. This pattern could be a repre that systems of oppression do not impact risk or resilience for DEBs, or any other health outcome (Wang et al. 2024), in uniform or linear ways.

evidence of interactive intersectional effects, where at least one

In fact, intersectional analyses capture nuance and complexity that would be blurred if we assume that risk or resilience are universal. For instance, although understudied, among transgender and gender-diverse adolescents, those who are Black or Hispanic experience similar levels of mental health outcomes as their non-Hispanic White peers in representative (Vance et al. 2021) and non-probability samples (Lawrence et al. 2024; Watson



**FIGURE1** | Predicted prevalence estimates for (A) restricting and (B) vomiting. The three strata with the highest prevalence and three strata with the lowest prevalence are larger, for ease of interpretation. The gender nonconforming group includes people whose gender identity is gender fluid, gender queer, or gender nonconforming.

et al. 2024). This means that mental health outcomes for transgender and gender-diverse youth may not universally vary at the intersection of gender and race/ethnicity. Although there were many instances where this same pattern of results was held in the present study, there were a handful of instances where significant racial/ethnic group differences were observed within a given gender identity subgroup. For example, among gender-nonconforming youth, those who were Hispanic had a significantly higher predicted prevalence of (1) restricting compared to those who were White and (2) binge eating compared to those who were Asian. Quantitative intersectionality approaches, such as MAIHDA, are uniquely suited to capturing these complexities and nuances.

Hispanic gender-nonconforming youth were the only stratum among the three highest-prevalence groups for multiple DEBs. While few studies have assessed DEBs among nonbinary or gender-nonconforming people overall, results from single-axis investigations of gender-diverse youth and intersectional investigations of cisgender youth help contextualize our results. From a single-axis perspective, in a sample of gender-diverse adolescents, restriction, purging, and binge eating were highest among nonbinary and questioning youth (Roberts et al. 2021). Similarly, Lefevor et al. (2019) found that genderqueer college students (defined as anyone whose gender identity was not cisgender and outside of the gender binary) experienced more eating concerns compared to transgender or cisgender men and women. From an intersectional perspective, the prevalence of fasting, purging, and using diet pills is pronounced among Hispanic girls specifically (Beccia et al. 2019). Further, adolescent-to-adult trajectories of unhealthy weight control behaviors (a composite including but not limited to restricting, self-inducing vomiting, and using diet pills) and binge eating prevalence are substantially higher for cisgender boys/men and cisgender girls/women who are Hispanic versus White (Simone et al. 2022). Thus, emerging evidence suggests that DEB prevalence is disproportionately high for both gender-nonconforming youth and Hispanic youth. Research is needed on the multilevel contributors to Hispanic gender-nonconforming youth's high DEB prevalence, such as examining the impacts of puberty (Anaya 2024); medical and/ or social transition (Chakkour et al. 2024); discrimination related to race/ethnicity and/or gender (Johnson, Forbush, and Swanson 2022; Scandurra et al. 2019; Wang et al. 2024); and family, neighborhood, and community context overall (Burnette, Burt, and Klump 2023; West et al. 2023).

Although the present study did not investigate ED prevalence, it is worth noting that the intersectional subgroups groups with the highest DEB prevalence—Black, Hispanic, or multiracial



**FIGURE 2** | Predicted prevalence estimates for (A) using diet pills and (B) binge eating. The three strata with the highest prevalence and three strata with the lowest prevalence are larger, for ease of interpretation. The gender nonconforming group includes people whose gender identity is gender fluid, gender queer, or gender nonconforming.

transgender boys, gender-nonconforming youth, and youth questioning their gender—included groups not historically been thought of as being at high risk for EDs. EDs are stereotypically thought of as primarily affecting White cisgender girls and women (Schaumberg et al. 2017). While White cisgender girls and women do have high DEB and ED prevalence, the present results and those of several other studies show that other intersectional subgroups experience DEBs and EDs at similar—or sometimes higher—levels as White cisgender girls and women (e.g., Beccia et al. 2019; Burke et al. 2023; Gordon et al. 2024; Simone et al. 2022).

Despite decades of research challenging stereotypes about which groups EDs affect, substantial disparities persist in which racial/ethnic groups are diagnosed with EDs and which groups seek or receive treatment for EDs: even with similar levels of ED symptoms, non-Hispanic White people are more likely to be diagnosed with EDs, seek ED treatment, and receive ED treatment compared to Hispanic people and people of color (Gordon et al. 2024; Grammer et al. 2022). These disparities could arise due to structural racism present within the US broadly and specifically within the US healthcare system (Shim 2021; Williams and Collins 2001). Thus, these results imply that more research is needed to understand the causes of DEBs among people with minoritized racial/ethnic and gender identities (e.g., Anaya 2024; Brown et al. 2022; Burnette et al. 2022), specifically to understand the factors across levels of influence that result in some intersectional subgroups' elevated DEB prevalence yet limited ED diagnosis and treatment. Specific ways to accomplish this implication include adding DEB measures to public health surveillance systems so that inequities can be monitored and tracked, increasing resources to clinics serving marginalized groups, and/or increasing funding for research on ED inequities.

## 4.1 | Strengths, Limitations, and Future Directions

To our knowledge, this study includes the largest subsample of gender-diverse people with whom DEB prevalence has been assessed. In addition, studying specific DEBs provides nuanced information that is not available when DEBs are operationalized as a composite.

Key limitations are as follows. First, this is not a representative sample. Due to small cell sizes, we (1) excluded participants who were American Indian/Alaska Native or Native Hawaiian, Pacific Islander, and whose gender identity did not fit within an



**FIGURE 3** | Strata where excess prevalence was significantly lower or significantly higher than what would have been expected based on additive effects alone. The *x*-axis zero point is the predicted prevalence based on additive effects alone for each stratum. Significant excess prevalence estimates and 95% credible intervals are plotted. The sign of the excess prevalence estimate indicates whether excess prevalence is significantly higher (positive values) or lower (negative values) than what would be expected based on additive effects alone. The gender nonconforming group includes people whose gender identity is gender fluid, gender queer, or gender nonconforming.

overarching category; and (2) combined gender-nonconforming, gender queer, or gender fluid youth into a single category. Thus, prevalence estimates reported here may differ from those that may be observed among sexual and gender minority youth more generally. Future research on DEBs is needed among nationally representative samples and specifically among American Indian and Alaska Native communities, Native Hawaiian and Pacific Islander communities, and gender-nonconforming, gender queer, and gender fluid people. Further, given that race and ethnicity were assessed with separate questions, anyone who reported Hispanic ethnicity was grouped in the Hispanic subgroup, regardless of their race(s). Whether Hispanic is more accurately conceptualized as a race, an ethnicity, or both lacks a clear, singular answer (Lopez, Krogstad, and Passel 2024). Second, due to concerns about precision, we were unable to explore additional dimensions of social positions relevant to the social patterning of DEBs, such as sexual orientation or weight status (Beccia et al. 2021; Gordon et al. 2023; Lawrence et al. 2024; Miller and Luk 2019). Third, and relatedly, there are multiple drivers of DEBs, which likely exist across levels of influence. Most of these drivers were not measured in the present study. The present study is thus both a necessary and incomplete step in the direction of gaining a more nuanced picture of the complex and intersectional landscape of DEBs among youth.

Future research must study the factors that drive DEBs, as the same behaviors can have different functions and causes between and within social groups (Reyes-Rodríguez et al. 2016). For instance, restriction among transgender and gender-diverse people is likely due to several non-mutually exclusive sources at individual, interpersonal, and structural levels of influence (Cusack, Iampieri, and Galupo 2022; Simone et al. 2024; Urban et al. 2024), and these drivers may differentially impact individuals over time (e.g., at different stages of social and/or medical transition; Chakkour et al. 2024). Some may restrict due to body dissatisfaction and the belief that one must have a smaller body and conform to societal ideals of thinness/leanness to have worth. Others may restrict to increase gender congruence (e.g., reduce hip or breast size, stop menstruation), as a result of gender dysphoria, as a response to marginalization (e.g., internalized transphobia, discrimination at interpersonal, community, or structural levels), and/or as a means by which to regulate painful emotions (Simone et al. 2024; Urban et al. 2024). A related point is that our conceptualizations of DEBs and EDs are likely influenced by gender binaries, stereotypical gender norms, and myths about who EDs do and do not affect (e.g., Alexander et al. 2024; Springmann, Svaldi, and Kiegelmann 2022).

Further, although the current study did not formally measure structural discrimination processes (rather, we conceptualize our social strata variable as a proxy for exposure to structural processes related to gender discrimination, gender binarism, cissexism, and racism), the observed VPC values and emerging research suggest that some variance in DEB prevalence is due to structural discrimination (e.g., Askew et al. 2024; Beccia et al. 2022). Clarifying the multilevel drivers of DEB prevalence has implications for designing and implementing interventions that are structurally sensitive and culturally competent.

# 4.2 | Conclusion

In summary, this study examined how DEB prevalence varies at the intersection of gender and racial/ethnic identities among a large sample of sexual and gender minority youth. Findings reinforce that the social patterning of DEBs is more comprehensively understood when considering multiple (vs. single) dimensions of social positioning. Although the field has often focused investigations on individual-level drivers of DEBs, attention to structural contributors is also needed, especially when conducting research with marginalized populations.

## **Author Contributions**

Lauren N. Forrest: conceptualization, formal analysis, visualization, writing – original draft, writing – review and editing. Brooke L. Bennett: conceptualization, writing – review and editing. Ariel Beccia: writing – review and editing. Rebecca Puhl: conceptualization, writing – review and editing. Ryan J. Watson: conceptualization, data curation, funding acquisition, project administration, writing – review and editing.

#### **Conflicts of Interest**

The authors declare no conflicts of interest.

#### Data Availability Statement

The data that support the findings of this study are available from the senior author upon reasonable request.

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#### **Supporting Information**

Additional supporting information can be found online in the Supporting Information section.