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Exploring the intersection of multiple social determinants of health and disordered eating behaviors in a population-based sample in the United States

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Abstract

Objective: Disordered eating behaviors (DEBs) have long-term, deleterious effects on health and are more prevalent among socially marginalized groups, likely as a result of systemic inequities across social determinants of health (SDoH). This exploratory study aimed to identify subgroups of emerging adults characterized by main and interactive associations between SDoH and two forms of DEB (binge eating, extreme unhealthy weight control behaviors).

Method: Participants ($n = 1568$; age 22.2 ± 2.1 years) from the United States were drawn from the EAT 2010–2018 longitudinal study. Conditional inference tree (CIT) analyses derived main and intersecting SDoH related to DEB across 33 input variables collected during adolescence and emerging adulthood.

Results: The binge eating CIT revealed five subgroups (prevalence: 6.3–23.2%) shaped by variables collected during emerging adulthood: appearance-based teasing ($p < .001$), financial difficulty ($p = .003$), gender ($p < .001$), and everyday discrimination ($p = .008$). The CIT results for extreme unhealthy weight control behaviors derived six subgroups (prevalence: 2.3–45.5%) shaped by weight teasing ($p < .001$) and gender ($p < .001$) during emerging adulthood and public assistance ($p = .008$) and neighborhood safety ($p = .007$) in adolescence.

Discussion: This exploratory study revealed distinct subgroups of emerging adults with varying DEB prevalence, suggesting that variability in DEB prevalence may be partially explained by intersecting SDoH during adolescence and emerging adulthood. Hypothesis-driven research and replication studies are needed to further explore the associations between SDoH and DEB during emerging adulthood.

Public Significance Statement: Disordered eating behaviors are common among young people in the United States and have long-term health consequences. This exploratory study identified subgroups of young people, characterized by combinations of social inequities (e.g., financial difficulties, teasing). Results highlight high-risk

subgroups of emerging adults that should be examined further in hypothesis-driven research.

KEYWORDS
conditional inference trees, disordered eating behaviors, social determinants of health

1 | INTRODUCTION

Disordered eating behaviors (DEBs), such as unhealthy weight control and binge eating, are common among young people in the United States (Neumark-Sztainer et al., 2011; Neumark-Sztainer, Story, et al., 2002). This brings cause for concern, as DEBs are associated with poorer physical and mental health (Herpertz-Dahlmann et al., 2015; Kärkkäinen et al., 2018). Increasing evidence suggests that DEBs are more prevalent among socially marginalized populations resulting from systemic inequities (Beccia et al., 2019; Neumark-Sztainer, Croll, et al., 2002). For instance, past research suggests that Hispanic/Latina girls have an excess risk of DEBs relative to White girls (Pernick et al., 2006). Similarly, evidence suggests that boys who hold a marginalized racial/ethnic identity have higher odds of disordered eating relative to White boys (Beccia et al., 2019). Yet, much of the research has centered participants' social identities (e.g., racial/ethnic identity), using such identities as proxies for the potential experiences distinct marginalized groups may have (e.g., racism). In doing so, such research may inadvertently stigmatize marginalized groups by highlighting the elevated risk they experience, rather than calling attention to the underlying systemic social determinants of health (SDoH) that may explain such elevated risk. Research is therefore critically needed to identify the systemic barriers and experiences that contribute to disparities in DEB prevalence in this group.

1.1 | Potential social determinants of health contributing to disordered eating behaviors

Health inequities are driven by systematic differences and disadvantages in the distribution of and access to health resources and opportunities based on one or more dimensions of social identity, and together comprise the context(s) in which health disparities emerge (Baciu et al., 2017). Specifically, SDoHs span across multiple domains including education, economic (e.g., employment, income), physical environment (e.g., housing, neighborhood safety), social environment (e.g., interpersonal discrimination), and health systems and services. Systemic disadvantages across SDoH domains have been shown to increase chronic stress, which is linked with poorer health outcomes (Shim et al., 2014; Thornton et al., 2016), such as binge eating (Brown et al., 2017). As such, it is possible that SDoH may more accurately explain disparities in DEB prevalence than social identity markers alone.

Emerging adulthood is a period characterized by major life changes that may magnify oppressive experiences related to SDoH as young people transition out of school and into the workforce or college (Arnett, 2000). Moreover, emerging adulthood represents a critical developmental period with regard to the onset of DEBs (Hudson et al., 2007; Volpe et al., 2016). As young adults age and experience more developmental milestones (e.g., attend or graduate college), their own educational attainment may become more influential than that of their parents, but during emerging adulthood, parental educational attainment and employment may distally contribute to emerging adults' DEB risk (e.g., via its influence on emerging adults' health literacy (Egerter et al., 2011)). A number of economic factors may also influence DEB risk. For instance, food insecurity and use of government assistance have been linked with DEBs (Hazzard et al., 2020; Hooper et al., 2020; Poll et al., 2020; Tester et al., 2016). It has been theorized that the distribution of government assistance resources creates a feast-or-famine cycle (e.g., when food availability drastically fluctuates over the course of a month), which in turn may prompt or exacerbate DEBs. Indeed, qualitative research has shown that involuntary dietary restriction in response to food insecurity may make dietary restriction for weight-related concerns rewarding (Taylor et al., 2020). In addition, financial difficulties have been shown to increase stress, which in turn may result in binge eating or eating to cope with stress (Brown et al., 2017).

Physical environment represents another SDoH domain that may contribute to inequities in DEB risk. Recent research suggests that neighborhood disadvantage (e.g., low perceived safety) may increase DEB risk among girls (Mikhail et al., 2021). For instance, low neighborhood safety may restrict access to physical movement (e.g., running outside), which may in turn lead to the adoption of less healthy methods of weight control. Moreover, individuals who report lower levels of neighborhood safety have reported higher levels of stress relative to those who perceive their neighborhoods to be safe; thus, as evidence suggests that stress may lead to the onset of DEBs (Mason & Lewis, 2015; Simone & Lockhart, 2016; Smyth et al., 2007), stress could also be a mechanism through which neighborhood safety may contribute to DEBs.

Interpersonal discrimination also likely contributes to or exacerbates DEB risk (Cheng, 2014; Hunger et al., 2020; Kwan et al., 2018). For instance, everyday forms of discrimination (e.g., being treated with less respect or courtesy than others) have been linked with higher prevalence of DEBs (Beccia et al., 2020; Yoon et al., 2022). Virginia Brook's minority stress theory suggests that social inequities and experiences such as discrimination, prejudice, and stereotypes increase stress, which in turn negatively impacts psychological and behavioral health (Brooks, 1981). To this end, experiences with everyday discrimination, as well as overt experiences of teasing and

harassment associated with social identity markers (e.g., race/ethnicity) and other socially constructed attributes (e.g., weight, gender) are also important to consider. Indeed, each form of discrimination, teasing, and harassment uniquely contribute to stress (Beccia et al., 2020; Earnshaw et al., 2016; Jones et al., 2020), and the intersection of such experiences likely magnifies these processes (Crenshaw, 1991). Moreover, social identity-related experiences of teasing and harassment have been shown to increase the internalization of stigmatizing beliefs, which may further increase the risk for DEB onset (Brondolo et al., 2012; Herek et al., 2009; O'Brien et al., 2016). For instance, past research suggests that the association between weight-related teasing and DEBs may be mediated by the internalization of weight stigma (O'Brien et al., 2016). Accordingly, increased DEB risk has been linked with everyday experiences of discrimination, as well as identity-related experiences of discrimination across several domains, including sexual orientation (Watson et al., 2016), ethnicity/race (Cheng, 2014), and weight status (Hunger et al., 2020).

1.2 | Modeling intersecting multidimensional risk factors

Past research has detected overall associations (hereafter referred to as main effects) of minority stress (Watson et al., 2016), elements of economic inequity (e.g., food insecurity; Hazzard et al., 2020), and experiences of everyday discrimination (Beccia et al., 2020; Yoon et al., 2022) with traditional hypothesis-testing methods. Yet the many potential interactions (hereafter referred to as interactive effects) between SDoH have not yet been examined in relation to DEBs. This study expands upon past work by our team and others by applying an intersectional lens to explore how intersecting dimensions of SDoH work together in their associations with DEB (Crenshaw, 1991). Intersectional theory was conceived by Black feminist scholars (Bowleg, 2012; Crenshaw, 1991), and highlights the importance of understanding intersecting systems of power, privilege and oppression to understand how systems interact and shape experiences in distinct ways (Crenshaw, 1991). Traditional regression approaches are not well-suited for research questions that aim to gain explore intersecting SDoH interactions across a wide range of dimensions, as such that a model would include all possible main and interactive (e.g., two- and three-way interactions) effects for all combinations of input variables. The large number of possible combinations would make model selection difficult (Hothorn et al., 2006; Strobl et al., 2009), may result in uninterpretable interactive effects (e.g., four-way interactive effects), and would require very large sample sizes to test all effects of interest (Hothorn et al., 2006).

Data-driven machine learning methods, such as classification algorithms, extend traditional methods and are particularly useful for exploratory research that aims to identify main and interactive effects among a large number of input variables worth exploring further in hypothesis-driven research (Hothorn et al., 2006; Strobl et al., 2009). A single decision tree approach was selected for this study to allow for the identification of unique and distinct subgroups of the sample, characterized by intersecting SDoH and social positions, rather than individual variables of importance (e.g., random forest). While there are numerous decision-tree methods that employ different algorithms, a conditional inference tree (CIT) approach is preferred for this study because other algorithms (e.g., CART) introduce selection bias toward input variables with many possible split points (e.g., continuous, categorical variables). CIT methods estimate a regression relationship among input variables through iterative partitioning that can handle input variables with different distributional properties. Within this framework, CIT models have the capacity to consider all input variables entered into a model simultaneously to identify distinct subgroups of the population based on the most important main and interactive effects for a given outcome (Hothorn et al., 2006; Strobl et al., 2009). As such, the findings from CIT methods may be important for guiding the study design and hypotheses of future data collection efforts.

1.3 | This study

Several pertinent SDoH may contribute to inequities in DEBs during emerging adulthood. An intersectional understanding of how these systems operate in unison is essential for understanding who is at greatest risk of developing DEBs; yet little is known about how SDoH work independently and together to contribute to DEB prevalence. The present exploratory study applied CIT analysis to (a) identify SDoH during adolescence and emerging adulthood and social identities (e.g., ethnicity/race, gender) contributing to two forms of DEBs (i.e., binge eating and extreme unhealthy weight control behaviors, eUWCBs) during emerging adulthood; and (b) derive unique subgroups of the sample characterized by main and interactive associations between SDoH and DEBs. The findings from this exploratory study may help identify pertinent main and interactive effects of SDoH on DEB during emerging adulthood.

2 | METHODS

2.1 | Study design and participants

Participants included emerging adults ($N = 1568$) from the EAT 2010–2018 (Eating and Activity over Time) longitudinal study, a population-based cohort study of weight, weight-related behaviors, and factors associated with these outcomes in young people from diverse socioeconomic and ethnic/racial backgrounds. Participants were first enrolled in the EAT 2010 survey during the 2009–2010 academic year at one of 20 public secondary schools in the urban area of Minneapolis-St. Paul, Minnesota (Larson et al., 2013; Neumark-sztainer et al., 2012). At follow-up, study invitation letters were mailed to EAT 2010 participants with the opportunity to complete the EAT 2018 survey online or by mail. Of the original 2793 participants, 410 (14.7%) were lost to follow-up due to missing contact information or no address found at follow-up. The EAT 2018 survey response rate

was 65.8% of the original participants who could be contacted at follow-up ($n = 2383$). The present sample ($N = 1568$) includes participants who completed surveys at both measurement occasions (EAT 2010 and EAT 2018). The sample of participants self-identified as 22.7% Asian, 22.1% African American/Black, 17.5% Hispanic/Latino/a, 23.4% white, and 14.3% mixed or other race. All protocols were approved by the University of Minnesota's Institutional Review Board Human Subjects Committee.

2.2 | Survey development

The EAT 2018 survey was largely based on the EAT 2010 survey but modified to ensure the language of questions and topics addressed were age-appropriate. The test–retest reliability of measures was examined using data from a subgroup of 112 young adult participants who completed the EAT 2018 survey twice within a period of 3 weeks. Survey development and test–retest reliability for baseline measures have been described elsewhere (Larson et al., 2013).

2.3 | Measures

2.3.1 | Outcome variables

The outcome variables were two forms of disordered eating: (1) binge eating and (2) eUWCBs. Both variables were measured during EAT 2010 and EAT 2018, wherein participant responses during emerging adulthood (EAT 2018) were modeled as outcome variables. *Binge eating* was assessed with two dichotomous (yes/no) questions adapted from the adult version of the Questionnaire on Eating and Weight Patterns-Revised: "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)?" and "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?" (Puhl et al., 2014). Participants who endorsed both of these items were considered to have experienced binge eating (i.e., overeating accompanied by a sense of loss of control). This measure has good psychometric properties in adults (Yanovski, 1993), including within the present sample (test–retest agreement = 86.9%). eUWCBs were assessed with the question: "*Have you done any of the following things to lose weight or keep from gaining weight during the past year?*," including diet pills, self-induced vomiting, laxative use, and diuretics (yes/no for each). Participants who endorsed at least one of these behaviors were categorized as having experienced eUWCBs (test–retest $r = .90$) (Neumark-Sztainer, Croll, et al., 2002).

2.3.2 | Input variables

The CIT models included 33 input variables including (a) 32 input variables representing SDoH collected during adolescence (EAT 2010) and/or emerging adulthood (EAT 2018; see Table 1), and (b) 1 input variable representing disordered eating during adolescence (binge eating or eUWCB, respectively). Variables were modeled such that they could exert independent or interdependent effects on each of the outcome variables.

2.4 | Statistical analysis

Descriptive statistics were computed using IBM SPSS 25 computer software. Two CIT models used recursive partitioning (Hothorn et al., 2006) to identify the independent and interdependent influence of input variables on each of the two measures of DEB. CIT models concurrently consider all input variables through linear rank tests to partition participants into distinct subgroups as they relate to the outcome variable. In a first step, CIT algorithms concurrently considered the linear associations between all input variables and outcome variable. In a second step, the input variable with the strongest linear association to the outcome variable was selected and a binary cut point, or split, was selected. In a third step, steps 1 and 2 are recursively repeated until an optimal solution was achieved. While CIT models can handle a large number of input variables, the method aims to identify the main and interactive effects that explain the most variability in the outcome of interest, rather than a resulting solution that includes as many input variables as possible. In fact, it is important to grow a tree that is not "overfit." Therefore, many recursive partitioning methods include "pruning" procedures and hyperparameters that may be tuned in a training set to mitigate the risk of identifying an overgrown solution.

CITs include several hyperparameters (e.g., mincriterion, minsplit, and mtry) that may be tuned through cross-validation procedures to identify a solution with a high predictive performance. A recent comprehensive empirical analysis examined six tuning methods (e.g., Random Search, Sequential Model-Based Optimization) across 94 publicly available datasets, wherein authors recommended the use of default CIT settings in most instances (Mantovani et al., 2018). Specifically, results from the empirical analysis revealed that the default CIT hyperparameters achieved greater predictive performative in 40% of cases and statistically equivalent performance to tuned hyperparameters in 35% of cases (Mantovani et al., 2018). Moreover, the dependent variables examined in this study were reported at a relatively low frequency in the sample (12.2%–13.2%). By splitting the sample into a training and test set, the frequency of each dependent variable would be further reduced which may further increase the risk of overfitting the decision tree in exchange for tuned hyperparameters that may not improve the predictive performance of the algorithm. Thus, rather than tuning hyperparameters with cross-validation procedures, the default CIT hyperparameters were applied (mincriterion = 0.95, minsplit = 20, minbucket = 7, and mtry = 0) and the multiplicity adjusted p-values stop criterion was used (Hothorn et al., 2006) to ensure that each CIT tree was grown to the appropriate size (e.g., number of splits). All CIT models were conducted in R Studio (version September 2, 2021.382; Team Rs. RStudio: Integrated Development Environment for R, 2022) using the *partykit* (version 1.2–15) package (Hothorn et al., 2021).

TABLE 1 Description of each of the input variables

Variable	Description
Input variables measured during both adolescence (EAT 2010) and emerging adulthood (EAT 2018)	
Teasing and/or harassment	"How often do any of the following things happen?" Response options included: never, less than once a year, a few times a year, a few times a month, at least once a week.
Race	"You are teased or harassed about your race" (test–retest $r = 0.64$)
Financial situation	"You are teased or harassed about your family's financial situation" (test–retest $r = 0.61$)
Sexual harassment	"You are teased or harassed in a sexual way (e.g., grabbing/pinching, sexual comments, unwanted touching, etc…") (test–retest $r = 0.64$)
Weight	"You are teased about your weight" (test–retest $r = 0.73$)
Appearance	"You are teased about your appearance" (test–retest $r = .73$)
Neighborhood safety	Neighborhood safety was measured with two questions at both measurement occasions: "The crime rate in my neighborhood makes it unsafe to go on walks during the [day/night]." Response options ranged from strongly disagree (1) to strongly agree (4). Responses were reverse coded and summed, with higher scores indicating greater neighborhood safety, and achieved adequate internal consistency at both EAT 2010 ($\alpha = .80$) and EAT 2018 ($\alpha = .82$).
Food insecurity	EAT 2010: If participants indicated they had ever been hungry (e.g., Some months but not every month) and experienced any compromise to food adequacy (e.g., Sometimes we do not have enough to eat) in the past 12 months, they were categorized as food insecure (test–retest $r = .77$, test–retest agreement = 96%) EAT 2018: Participants who indicated that they (1) had eaten less than they felt they should because there wasn't enough money and (2) that they were hungry but did not eat because there was not enough money for food in the past 12 months, they were categorized as experiencing food insecurity (test–retest agreement = 81.2%).
Public assistance	"In the past year, did you or any member of your household receive WIC (Women, Infants, and Children Program) benefits or SNAP (Supplemental Nutrition Assistance Program or Food Stamp Program) benefits?" Response options: no, yes, I do not know. (test–retest agreement = 92.7%)
Input variables measured only during adolescence (EAT 2010)	
Race/ethnicity	Response options: (1) White; (2) Black or African American; (3) Hispanic or Latino; (4) Asian American; (5) Native Hawaiian or other Pacific Islander; (6) American Indian or Native American; and (7) Other. Due to small cell sizes, race/ethnicity was modeled with 5 categories: Asian, Black/African American, Hispanic/Latino, white, and Mixed/Other (test–retest agreement = 98–100%).
U.S. nativity	"Were you born in the United States?" Response options: yes, no
Household language	"What language is usually spoken in your home?" Response options: (1) English; (2) A language other than English; and (3) English and another language about equally
Highest parental education	"How far in school did your [mother/father] go?" Options: (1) less than high school; (2) high school or GED; (3) some college or training after high school; (4) college degree; (5) advanced degree; (6) I do not know. Responses to both questions were combined into a single variable, reflecting the highest known level of education that participants' parents attained.
Parental employment	"Does your [mother/father]" (1) work full time; (2) work part time; (3) not work for pay; (4) I do not know
Input variables measured only during emerging adulthood (EAT 2018)	
Gender	"Are you…?" Response options: (1) Male, (2) Female, (3) Different identity (test–retest agreement = 100%)
Personal income	"What is <u>your</u> current <u>yearly</u> income before taxes and deductions? Please do not include the income of others in your household." (1) None; (2) under $5000 a year; (3) $5000–14,999 a year; (4) 15,000-24,999; (5) $25,000-29,999; (6) $30,000-39,999; (7) ≥ $40,000 (r = 0.74)
Student status	(1) Not a student (2) Full time (3) part time (4) graduate. Test–retest agreement = 92.0%
Personal education	"What is the highest level of education that you have completed?" Responses ranged from (1) middle school or junior high to (8) graduate or professional degree (MS, MBA, MD, PhD, etc). Due to small cell size, responses were categorized into five groups: less than high school, high school or GED equivalent, college degree, advanced degree, and vocational or other. Test–retest agreement = 92.0%
Living situation	Participants were asked who they lived with the majority of the time during the past year. Categories: alone, with roommates, with parents, other. Test–retest agreement = 100%
Work status	Participants were asked about their current work status. Categories: full time, part time, unemployed, other. Test–retest agreement = 83.0%
Hours of work (weekly)	"How many hours a week do you currently work for pay?" Categories: 1–19 h, 20–39 h, 40 h, more than 40 h (test–retest $r = 0.89$).
Financial difficulty	How difficult is it for you to get by financially right now? (Price, Choi, & Vinokur, 2002). Response options: Not at all difficult, Somewhat difficult, Very difficult or can barely get by, Extremely difficult or impossible. Due to small cell sizes,

(Continues)

TABLE 1 (Continued)

Variable	Description
	response options very difficult or can barely get by and extremely difficult or impossible were merged (test–retest agreement = 92%).
Everyday discrimination	Participants responded to three questions pertaining to everyday experiences of discrimination, such as being treated with less respect or courtesy or receiving poorer service than other people. Response options included: never, less than once a year, a few times a year, a few times a month, at least once a year. Everyday discrimination frequency ranges between 3–15 ($\alpha = 0.83$, test–retest $r = 0.69$).
Stressful life events	Participants indicated whether or not they had experienced six stressful life events related to: police activity, physical abuse, sexual abuse, violent death of a close friend or family member, or exposure to serious physical violence in their environment. Survey items were based on the Life Events Questionnaire and Brief Trauma Questionnaire. Responses were summed to represent the number of events experienced (test–retest agreement = 85%).
Adverse childhood experiences	Adverse experiences in childhood (<18 years) were assessed by asking participants about their own experiences of physical, emotional, and sexual abuse as well as three questions regarding other dimensions of dysfunction in their childhood household. The authors defined participants as exposed to each type of maltreatment using the following definitions, informed by the ACEs Scale. Responses were summed to represent the number of events experienced (test–retest agreement = 85%).

3 | RESULTS

Within the sample, prevalence of binge eating (12.2%) and eUWCBs (13.2%) were comparable. A portion of participants endorsed both binge eating and eUWCB in emerging adulthood ($n = 122$), representing 34.8% of those endorsing binge eating and 32.0% of those endorsing eUWCBs. To contextualize the distribution of DEBs in the sample, gender-stratified prevalence of binge eating and eUWCBs by racial and ethnic identity are presented in Table S1.

The sample was heterogeneous with regards to representation of emerging adults with different racial/ethnic identities (14.3–22.7% across groups), personal income (8.9–25.6% across levels), and parental educational attainment (7.3–40.6% across levels). Sample characteristics for each of the input variables are presented in Table 2. Exposure to specific teasing and/or harassment was reported at varying frequencies across distinct forms of stigma/harassment (Table 3). For instance, during emerging adulthood, prevalence of teasing/harassment based on race or ethnicity at a frequency of at least once a year (17.0%) or a few times a year (15.6%) was higher than prevalence of teasing/harassment based on financial situation (12.8% and 12.1%, respectively) or sexual harassment (7.7% and 9.0%, respectively).

3.1 | Model-derived subgroups based on intersecting SDoH and prevalence of binge eating

The CIT revealed five subgroups with binge eating prevalence ranging from 6.3–23.2% (Figure 1). The five subgroups were shaped by four of the 33 input variables, all of which were variables collected during emerging adulthood: appearance-based teasing ($p < .001$), financial difficulty ($p = .003$), gender ($p < .001$), and everyday discrimination ($p = .008$). Appearance-based teasing during emerging adulthood was the first splitting variable and, thus, had the strongest association with binge eating, wherein the CIT-derived dichotomous split was based on the frequency of appearance-based teasing, including: (1) never and (2) between more than once a year—a few times a week. The two subgroups with the highest prevalence of binge eating (23.2% and 22.8, respectively) were as follows: (1) individuals who experienced any appearance-based teasing and identified as female or another gender ($N = 396$); and (2) individuals who experienced any appearance-based teasing, identified as male and reported an everyday discrimination score greater than 9 ($N = 57$). In contrast, the lowest prevalence of binge eating (6.3%) was among individuals who never experienced appearance-based teasing and reported lower (not at all, somewhat) financial difficulty ($N = 727$).

3.2 | Model-derived subgroups based on intersecting SDoH and prevalence of eUWCBs

The results from the CIT model are presented in subgroups with eUWCB prevalence ranging from 2.3 to 45.5% (Figure 2). The six subgroups were shaped by four input variables, collected during adolescence (public assistance, neighborhood safety) and emerging adulthood (weight teasing, gender). Weight-based teasing in emerging adulthood was the first splitting variable and thus, had the strongest association with eUWCBs, wherein the CIT-derived dichotomous split was based on the frequency of weight-based teasing, including: (1) between never—less than once a year and (2) between a few times a month—a few times a week. The subgroup with the highest eUWCB prevalence (45.5%) contained men and people with another gender identity, who endorsed experiencing weight teasing less than once per year during emerging adulthood and low perceived neighborhood safety during adolescence ($N = 11$). The CIT-derived subgroup with the second highest eUWCB prevalence (35.3%) was comprised of participants who reported experiencing weight teasing during emerging adulthood between a few times a year to a few times a week and indicated

TABLE 2 Sample descriptive statistics on input variables collected in adolescence and emerging adulthood

		EAT 2010		EAT 2018	
Variable	**Range**	***N* or *M***	**% or SD**	***N* or *M***	**% or SD**
Input variables measured at both time points					
Neighborhood safety	2–8	6.02	1.86	5.88	1.88
Food insecurity					
No		1322	84.3	1185	77.7
Yes		193	12.7	340	22.3
Public Assistance					
No		723	46.4	1023	67.7
Yes		465	29.8	370	24.5
I do not know		370	23.7	119	7.9
Input variables measured during adolescence					
Race/Ethnicity					
Asian		355	22.7		
African American/Black		345	22.1		
Hispanic/Latino/a		274	17.5		
White		366	23.4		
Mixed or other		223	14.3		
U.S. Nativity		1312	83.7		
Household Language					
English		927	59.2		
Another language		205	13.1		
English + another language		433	27.7		
Highest parental education					
Less than high school		167	10.8		
High school or equivalent		224	14.5		
Some college		248	16.0		
Graduated college		326	21.0		
Advanced degree		192	12.4		
I do not know		392	25.3		
Mother Employment					
Full time		646	41.9		
Part time		250	16.2		
Not working for pay		217	14.1		
I do not know		427	27.7		
Father Employment					
Full time		664	47.1		
Part time		131	9.3		
Not working for pay		137	9.7		
I do not know		479	33.9		
Input variables measured during emerging adulthood					
Gender					
Male				642	41.3
Female				900	58.0
Another Gender				11	0.7

(Continues)

TABLE 2 (Continued)

Variable	Range	EAT 2010		EAT 2018	
		N or *M*	% or SD	*N* or *M*	% or SD
Personal income					
None				162	10.8
<$5000/year				209	13.9
$5000–$14,999				384	25.6
$15,000–29,999				317	21.1
$25,000–29,999				134	8.9
$30,000–39,999				148	9.9
≥40,000				145	9.7
Student Status					
Not a student				840	54.4
Full time student				495	32.1
Part time student				176	11.4
Graduate student				33	2.1
Personal Education					
Less than high school				89	5.7
High school or equivalent				445	28.7
College degree				318	20.5
Advanced degree				17	1.1
Vocational or other				680	43.9
Living Situation					
Alone				121	7.7
With parents				699	44.6
With roommates				324	20.7
Other				424	27.0
Work status					
Full time				791	51.2
Part time				432	28.0
Unemployed				177	11.5
Other				145	9.4
Hours of work (weekly)					
1–19 h				193	16.0
20–39 h				431	35.7
40 h				397	32.9
More than 40 h				186	15.4
Financial difficulty					
Not at all				279	18.4
Somewhat				897	59.3
Very difficult/Can barely get by				337	22.3
Everyday Discrimination	3–15			6.06	2.98
Stressful Life Events (count)	0–6			0.62	1.13
Adverse Childhood Experiences (count)	0–6			1.01	1.45

that they received public assistance in adolescence ($N = 150$). In contrast, the prevalence of eUWCBs was lowest (2.3%) among individuals who reported never experiencing weight-based teasing and identified as male or people with another gender identity ($N = 396$).

4 | DISCUSSION

This exploratory study aimed to derive important main and interactive associations across a broad range of SDoH during adolescence and

TABLE 3 Prevalence and frequency of teasing, harassment, and discrimination in the EAT 2018 sample

Measurement occasion form of teasing or harassment	Frequency of teasing or harassment				
	Never	<Once a year	A few times a year	A few times a month	At least once a week
EAT 2010					
Race/ethnicity	65.5	15.8	11.2	5.1	2.3
Financial situation	85.7	8.0	4.2	1.6	0.6
Sexual harassment	74.5	10.1	7.8	3.4	4.1
Weight	65.5	13.6	10.2	5.4	5.2
Appearance	57.3	18.5	12.2	6.5	5.4
EAT 2018					
Race/ethnicity	61.7	17.0	15.6	4.7	1.0
Financial situation	69.4	12.8	12.1	4.1	1.6
Sexual harassment	79.3	7.7	9.0	3.0	1.0
Weight	58.5	12.8	18.2	6.9	3.6
Appearance	55.7	16.4	18.5	6.3	3.0

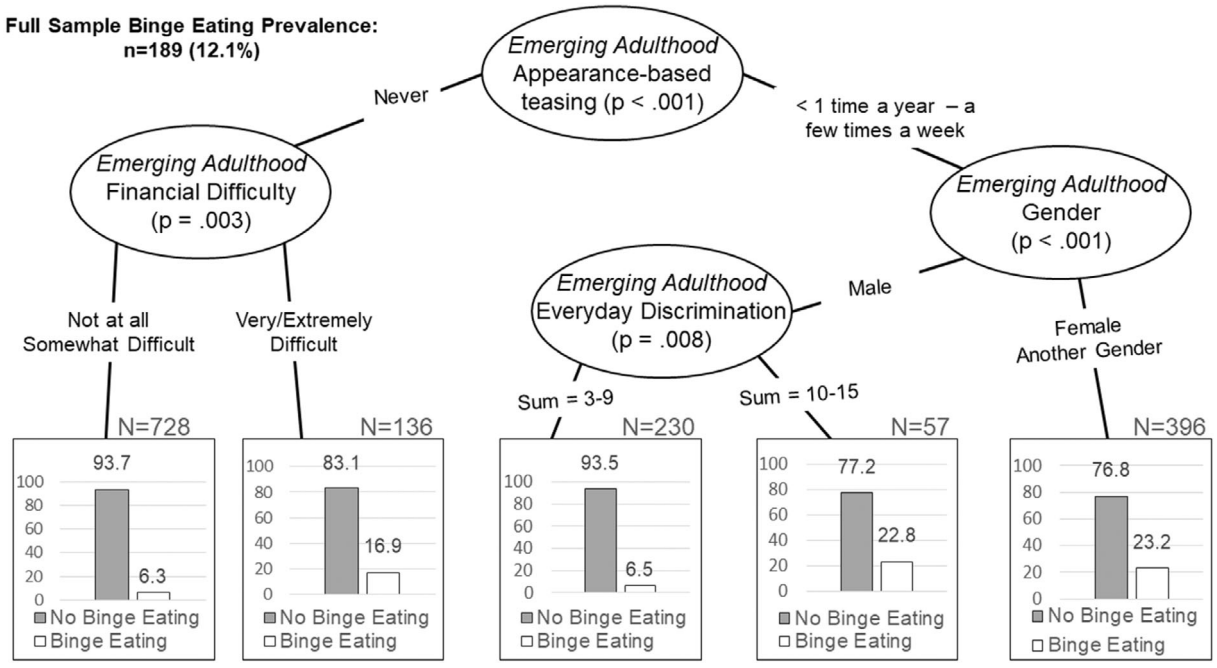

FIGURE 1 Conditional inference tree results for binge eating during emerging adulthood

emerging adulthood to understand how social experiences, positions, and identities related to systems of power, privilege, and oppression may intersect to influence DEBs in a large, population-based sample of ethnically/racially and socioeconomically diverse emerging adults. In general, the results from this study suggest that exposure to contextually relevant experiences of everyday discrimination and teasing/harassment in emerging adulthood (e.g., appearance- or weight-based), as well as economic factors in emerging adulthood (e.g., financial difficulty) and adolescence (e.g., public assistance) and physical safety during adolescence (e.g., neighborhood safety) may contribute to variability in DEB prevalence during emerging adulthood. The current findings also revealed heterogeneity in the variables of importance that emerged for binge eating relative to those that emerged for eUWCB and gender differences, each of which is described in detail below.

In contrast with traditional hypothesis testing methods, from which results may be used to inform preventive interventions or treatments, exploratory CIT methods identify subgroups within a single sample based on variables of importance out of a larger number of input (i.e., independent) variables. CIT results offer insights about the main and interactive effects contributing variability in our outcome measures, binge eating, and eUWCBs, across the derived subgroups that exceed what is expected by chance. Research findings from CIT methods may

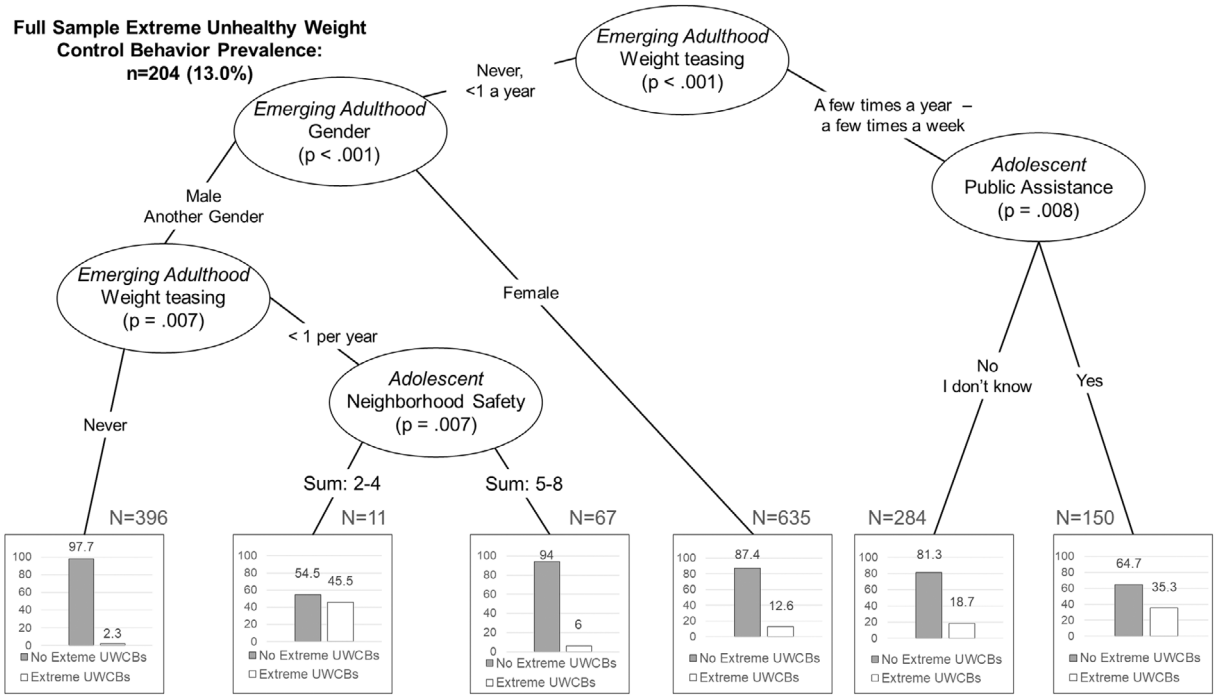

FIGURE 2 Conditional inference tree results for extreme unhealthy weight control behaviors during emerging adulthood

then guide future research studies that integrate traditional hypothesis testing methods to explore the associations between variables in a more intentional way to guide future preventive efforts. The results from this study highlight several variables that are already documented in the literature as pertinent risk factors for DEB, including appearance-based teasing (Dahill et al., 2021), weight teasing (Eisenberg et al., 2012; Hunger et al., 2020; Puhl et al., 2014), everyday discrimination (Beccia et al., 2020; Yoon et al., 2022), gender (Keel et al., 2007; Maine & Bunnell, 2015; Pritchard et al., 2006), and financial difficulty (Richardson et al., 2015; Simone et al., 2021), as well as two variables collected during adolescence that have been explored less in the literature: receipt of public assistance and neighborhood safety (Mikhail et al., 2021) that are worth investigating further in future research studies.

Consistent with past hypothesis-driven research (Dahill et al., 2021; Hunger et al., 2020; Puhl et al., 2014), CIT analyses identified contextually relevant experiences of teasing as variables of importance for both DEB outcomes. Exposure to body image-oriented teasing, specifically appearance and weight teasing, were the input variables most strongly associated with DEBs. More specifically, weight teasing was the variable of the greatest importance for eUWCBs, whereas appearance-based teasing was the variable most strongly associated with binge eating. Results suggest that weight-specific teasing may be more strongly associated with restrictive and/or compensatory DEBs as the form of teasing was more directly related to body weight and shape. In contrast, general appearance-based teasing was associated with binge eating, which may in part be explained by stress associated with teasing (Mason & Lewis, 2015; Simone & Lockhart, 2016), particularly when appearance-based teasing was not necessarily tied explicitly to weight.

While the binge eating solution included only input variables from emerging adulthood, the eUWCB solution included two contextual factors during adolescence (neighborhood safety, receipt of public assistance), gender, and weight teasing during emerging adulthood. This finding suggests that contextual SDoH (e.g., neighborhood safety, public assistance) during adolescence may persist in their association with eUWCBs into emerging adulthood. However, more research is needed to evaluate the longitudinal associations between SDoH during adolescence and DEB in emerging adulthood.

Beyond the identification of individual input variables, a unique contribution of this study pertains to the identification of distinct subgroups characterized by intersecting oppressive experiences across SDoH domains during adolescence and emerging adulthood. The CIT results revealed several subgroups warrant further investigation in future hypothesis-driven research efforts. For binge eating, high-risk groups of interest include (a) men who report appearance-based teasing at any frequency and high levels of everyday discrimination (prevalence: 22.8%), (b) emerging adults who report no appearance-based teasing and extreme financial difficulties (prevalence: 16.9%), and (c) women and people with another gender who experienced any frequency of appearance-based teasing (prevalence: 23.2%). For eUWCBs, high-risk groups of interest include (a) men and people of another gender who reported weight teasing less than once a year and reported low perceived neighborhood safety during adolescence (prevalence: 45.5%); and (b) emerging adults who report experiencing weight teasing at least a few times a year and reported receipt of public assistance in adolescence (prevalence: 35.3%). Together, the derived subgroups suggest that contextual factors in adolescence and emerging adulthood may be important to consider alongside body

image-related teasing when examining DEB risk in emerging adulthood. As with all CIT analyses, results should be interpreted with caution as they are limited in their generalizability and should be extended with hypothesis-driven research.

Perhaps just as notable as the variables of importance that emerged from the CITs, are the input variables that did not appear in the solutions. For instance, while adolescent reports of binge eating and eUWCBs were entered as input variables for each of their respective models, adolescent DEB did not emerge as a variable of importance in explaining variability in either DEB variable. This finding was unexpected, as recent research within this cohort revealed relatively high rates of DEB continuity from adolescence into emerging adulthood (Hooper et al., 2022). The present results suggest that appearance and/or weight-based teasing in emerging adulthood may explain more variability in binge eating and eUWCBs in emerging adulthood than adolescent DEBs. However, the current finding does not suggest that adolescent DEB is not at all important given the current analytic approach. Specifically, all decisions following the first variable in the CIT solution (appearance/weight teasing) are conditional, such that the next most variables in the tree are selected separately in two partitions of the sample. For instance, in the binge eating analysis, the selection process occurred separately for participants who: (1) never experienced weight teasing and (2) experienced weight teasing between less than once a year and a few times a week. Thus, the exclusion of adolescent DEB in the resulting solutions should be interpreted with caution.

Ethnic/racial identity did not emerge as variables of importance for either of the CITs conducted. It is possible that ethnic/racial differences identified in earlier work (Beccia et al., 2019; Pernick et al., 2006) may be better explained by oppressive systems operating across interpersonal (i.e., discrimination, teasing), economic, and environmental SDoH domains. Indeed, the present findings suggest that the use of ethnic/racial identity as a proxy for experience may unintentionally place blame on specific groups of individuals rather than the systems that perpetuate disparities.

4.1 | Gender differences

Gender emerged as a variable of importance in the solution for both outcomes, allowing for further discussion of potentially relevant gender differences in the SDoH associated with DEBs. In both instances, gender was revealed on only one branch of the tree, immediately following the variable of greatest importance (appearance- or weight-based teasing) and included no further variables of importance for women. In the binge eating solution, the subgroup reported the highest prevalence (23.2%) and contained women and people of another gender who also reported appearance-based teasing at any frequency. Following the gender-based split for the eUWCB solution, a subgroup was identified that included women who reported weight teasing less than once a year, wherein eUWCB prevalence was comparable to the full sample (12.3% relative to 13.0%). It is possible that weight/appearance-based teasing alone explains variability in DEB prevalence in this group, or that other relevant SDoH that were not available to examine in this study (e.g., identity-related discrimination, health care access) may explain additional variance in DEB among women and people with another gender. However, the current analyses were not stratified by gender; rather gender emerged as a pertinent input variable in only some cases. As such, women were also present within subgroups in branches of the tree wherein gender did not emerge as an input variable and thus gender-based differences must be interpreted with caution.

The current findings revealed that rates of binge eating among men only reached similar rates to those observed among women and people of another gender when men were also exposed to a high level of everyday discrimination. For instance, binge eating prevalence among women and people of another gender who were exposed to any frequency of appearance-based teasing was equivalent to men who are exposed to any frequency of appearance-based teasing and reported high levels of everyday discrimination (23.2%); a prevalence that was nearly four times higher than men who endorsed low levels of everyday discrimination (6.5%). In sum, the results from this study revealed that appearance- and weight-based teasing accounted for a larger proportion of the variability in DEB rates among women relative to men. In contrast, multiple forms of oppressive experiences may better explain the variability in DEB rates among men.

4.2 | Strengths and limitations

This study has several strengths. For instance, this is the first known study to examine a wide range of multidimensional SDoH that may contribute to DEBs in a population-based ethnic/racially and socioeconomically diverse sample. Another strength of this study includes the identification of unique high-risk subgroups of the sample, characterized by main and intersecting effects of SDoH in adolescence and emerging adulthood on DEB in emerging adulthood, which has implications for potential preventive interventions. The application of CITs is also considered a strength of this present study, given their capacity to identify main and interactive effects across a large number of potentially interrelated input variables, which allowed us to narrow down the scope of potential SDoH in adolescence and emerging adulthood that contributes to variability in DEB prevalence during emerging adulthood.

The study also contains several limitations. First, it is important to address the limitations of CIT and single decision tree approaches. Such methods have gained attention for their ease of interpretation and visually appealing plots, but there are several limitations to CIT algorithms: (a) the resultant tree structure is largely influenced by the first splits identified in the recursive partitioning and thus may not identify variables of importance if such variables are not conditionally associated with variables identified at the top of the decision tree, (b) the linear rank test does not consider nonlinear effects, (c) single tree solutions can have large variance which may reduce generalizability, and (d) CIT algorithms cannot handle inverse probability weighting procedures and thus the present results are limited in their

generalizability to the baseline (EAT 2010) sample. Given the data-driven approach inherent in CIT algorithms, the results of this study (and other CIT analyses) cannot be interpreted in ways typically presented in hypothesis-driven research. Moreover, some of the resulting nodes from the CITs include fairly small subgroups of the sample, which reduce the generalizability of the study findings. While the ability to detect meaningful subgroups with small cell sizes is considered a strength of CIT analyses, more research is needed to validate the findings from this study. The self-report nature of the data analyzed also presents as a limitation. For instance, the prevalence of binge eating may be influenced by participants' subjective experiences and perceptions. In addition, this study does not include some pertinent SDoH. For example, while emerging adult income and economic factors (e.g., financial difficulty, public assistance) were included as input variables, parental income was not measured and therefore the full spectrum of financial resources available to emerging adults may not have been considered. Moreover, this study did not assess housing access, access to healthcare, identity-specific discrimination with validated measures, minority stress processes (e.g., internalized stigma, hopelessness), or the full spectrum of gender identity (e.g., transgender, gender diverse), or other marginalized social positions (e.g., sexual orientation, disability status). As such, more research is needed in additional datasets wherein the comprehensive assessment of potential SDoH that may contribute to DEB is assessed to further validate the present findings.

5 | CONCLUSION

The current exploratory study has shed light on pertinent economic, environmental, and social factors and has the potential to guide future prospective studies to examine these factors in more detail. In sum, the present findings revealed a number of multidimensional SDoH reported in adolescence and emerging adulthood that may be linked with DEB in emerging adulthood. Notably, each of the derived SDoH that emerged in the present analyses relates to shared global experiences of social/interpersonal oppression (e.g., discrimination, teasing), economic inequities (e.g., financial difficulties, public assistance), and environmental context (e.g., neighborhood safety). Consistent with existing hypothesis-drive research (Hunger et al., 2020; Puhl et al., 2008; Puhl et al., 2014), CIT models identified associations between contextually relevant experiences of teasing (i.e., weight, appearance) and DEBs (Hunger et al., 2020; Puhl et al., 2008; Puhl et al., 2014). This study also revealed several subgroups worth examining further in hypothesis-driven research: (a) men who report appearance-based teasing at any frequency and high levels of everyday discrimination, (b) emerging adults who report no appearance-based teasing and extreme financial difficulties, (c) men and people with another gender who report weight teasing less than once a year and low perceived neighborhood safety during adolescence, and (d) emerging adults who report experiencing weight teasing at least a few times a year and report receipt of public assistance in adolescence. To achieve this aim, future research should measure body image-related teasing, neighborhood safety, and several economic domains (financial difficulty, public assistance). In sum, the present findings show that contextual, environmental, economic, and interpersonal SDoH may explain more variability in DEB prevalence than socially constructed identities alone; thus, researchers should use caution when modeling social identities as proxies for experiences.

AUTHOR CONTRIBUTIONS

Melissa Simone: Conceptualization; formal analysis; funding acquisition; investigation; methodology; resources; software; writing – original draft; writing – review and editing. **Jaime Slaughter-Acey:** Conceptualization; investigation; methodology; resources; visualization; writing – original draft. **Vivienne M Hazzard:** Conceptualization; investigation; methodology; visualization; writing – review and editing. **Marla Eisenberg:** Conceptualization; investigation; resources; writing – review and editing. **Dianne Neumark-Sztainer:** Data curation; funding acquisition; project administration; resources; supervision; writing – original draft.

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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REFERENCES

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *The American Psychologist*, *55*(5), 469–480. https://doi.org/10.1037/0003-066X.55.5.469

Baciu, A., Negussie, Y., Geller, A., & Weinstein, J. N. (Eds.). (2017). *Communities in action: Pathways to health equity*. National Academies Press. https://doi.org/10.17226/24624

Beccia, A. L., Baek, J., Jesdale, W. M., Austin, S. B., Forrester, S., Curtin, C., & Lapane, K. L. (2019). Risk of disordered eating at the intersection of gender and racial/ethnic identity among U.S. high school students. *Eating Behaviors*, *34*, 101299. https://doi.org/10.1016/J.EATBEH.2019.05.002

Beccia, A. L., Jesdale, W. M., & Lapane, K. L. (2020). Associations between perceived everyday discrimination, discrimination attributions, and binge eating among Latinas: Results from the National Latino and Asian American study. *Annals of Epidemiology*, *45*, 32–39. https://doi.org/10.1016/J.ANNEPIDEM.2020.03.012

Bowleg, L. (2012). The problem with the phrase women and minorities: Intersectionality-an important theoretical framework for public health. *American Journal of Public Health*, *102*, 1267–1273. https://doi.org/10.2105/AJPH.2012.300750

Brondolo, E., Libretti, M., Rivera, L., & Walsemann, K. M. (2012). Racism and social capital: The implications for social and physical well-being. *Journal of Social Issues*, *68*(2), 358–384. https://doi.org/10.1111/j.1540-4560.2012.01752.x

Brooks, V. R. (1981). *Minority stress and lesbian women*. Lexington Books.

Brown, M., Robinson, L., Campione, G. C., Wuensch, K., Hildebrandt, T., & Micali, N. (2017). Intolerance of uncertainty in eating disorders: A systematic review and meta-analysis. *European Eating Disorders Review*, *25*(5), 329–343. https://doi.org/10.1002/ERV.2523

Cheng, H. L. (2014). Disordered eating among Asian/Asian American women: Racial and cultural factors as correlates. *The Counseling Psychologist*, *42*(6), 821–851. https://doi.org/10.1177/0011000014535472

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, *43*, 1241–1299. https://doi.org/10.2307/1229039

Dahill, L. M., Touyz, S., Morrison, N. M. V., & Hay, P. (2021). Parental appearance teasing in adolescence and associations with eating problems: A systematic review. *BMC Public Health*, *21*(1), 450. https://doi.org/10.1186/s12889-021-10416-5

Earnshaw, V. A., Rosenthal, L., Carroll-Scott, A., Santilli, A., Gilstad-Hayden, K., & Ickovics, J. R. (2016). Everyday discrimination and physical health: Exploring mental health processes. *Journal of Health Psychology*, *21*(10), 2218–2228. https://doi.org/10.1177/1359105315572456

Egerter, S., Braveman, P., Sadegh-Nobari, T., Grossman-Kahn, R., & Dekker, M. (2011). *Education and health*. Robert Wood Johnson Foundation.

Eisenberg, M. E., Berge, J. M., Fulkerson, J. A., & Neumark-Sztainer, D. (2012). Associations between hurtful weight-related comments by family and significant other and the development of disordered eating behaviors in young adults. *Journal of Behavioral Medicine*, *35*(5), 500–508. https://doi.org/10.1007/s10865-011-9378-9

Hazzard, V. M., Loth, K. A., Hooper, L., & Becker, C. B. (2020). Food insecurity and eating disorders: A review of emerging evidence. *Current Psychiatry Reports*, *22*(12), 74. https://doi.org/10.1007/s11920-020-01200-0

Herek, G. M., Gillis, J. R., & Cogan, J. C. (2009). Internalized stigma among sexual minority adults: Insights from a social psychological perspective. *Journal of Counseling Psychology*, *56*, 32–43.

Herpertz-Dahlmann, B., Dempfle, A., Konrad, K., Klasen, F., & Ravens-Sieberer, U. (2015). Eating disorder symptoms do not just disappear: The implications of adolescent eating-disordered behaviour for body weight and mental health in young adulthood. *European Child & Adolescent Psychiatry*, *24*(6), 675–684. https://doi.org/10.1007/s00787-014-0610-3

Hooper, L., Mason, S. M., Telke, S., Larson, N., & Neumark-Sztainer, D. (2022). Experiencing household food insecurity during adolescence predicts disordered eating and elevated body mass index 8 years later. *The Journal of Adolescent Health*, *70*(5), 788–795. https://doi.org/10.1016/J.JADOHEALTH.2021.11.026

Hooper, L., Telke, S. E., Larson, N., Mason, S., & Neumark-sztainer, D. (2020). Household food insecurity: Associations with disordered eating behaviours and overweight in a population-based sample of adolescents. *Public Health Nutrition*, *23*(17), 3126–3135. https://doi.org/10.1017/S1368980020000464

Hothorn, R, Seibold, H, & Zeieis, A. A toolkit for recursive partitioning; 2021. Retrieved from http://partykit.r-forge.r-project.org/partykit/.

Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased recursive partitioning: A conditional inference framework. *Journal of Computational and Graphical Statistics*, *15*(3), 651–674. https://doi.org/10.1198/106186006X133933

Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, *61*(3), 348–358. https://doi.org/10.1016/j.biopsych.2006.03.040

Hunger, J. M., Dodd, D. R., & Smith, A. R. (2020). Weight discrimination, anticipated weight stigma, and disordered eating. *Eating Behaviors*, *37*, 101383. https://doi.org/10.1016/J.EATBEH.2020.101383

Jones, S. C. T., Anderson, R. E., Gaskin-Wasson, A. L., Sawyer, B. A., Applewhite, K., & Metzger, I. W. (2020). From "crib to coffin": Navigating coping from racism-related stress throughout the lifespan of black Americans. *The American Journal of Orthopsychiatry*, *90*(2), 267–282. https://doi.org/10.1037/ORT0000430

Kärkkäinen, U., Mustelin, L., Raevuori, A., Kaprio, J., & Keski-Rahkonen, A. (2018). Do disordered eating behaviours have long-term health-related consequences? *European Eating Disorders Review*, *26*(1), 22–28. https://doi.org/10.1002/erv.2568

Keel, P. K., Baxter, M. G., Heatherton, T. F., & Joiner, T. E. (2007). A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *Journal of Abnormal Psychology*, *116*(2), 422–432. https://doi.org/10.1037/0021-843X.116.2.422

Kwan, M. Y., Gordon, K. H., & Minnich, A. M. (2018). An examination of the relationships between acculturative stress, perceived discrimination, and eating disorder symptoms among ethnic minority college students. *Eating Behaviors*, *28*, 25–31. https://doi.org/10.1016/J.EATBEH.2017.12.003

Larson, N. I., Wall, M. M., Story, M. T., & Neumark-Sztainer, D. (2013). Home/family, peer, school, and neighborhood correlates of obesity in adolescents. *Obesity*, *21*(9), 1858–1869. https://doi.org/10.1002/oby.20360.Home/family

Maine, M., & Bunnell, D. (2015). Gendered considerations in the treatment and prevention of eating disorders. *Eating Disorders and Obesity*, *25*, 21–44. https://doi.org/10.1002/9781119221708.CH2

Mantovani, R. G., Horváth, T., Cerri, R., Junior, S. B., Vanschoren, J., & de Carvalho A. C. P. L. F. (2018). An empirical study on hyperparameter tuning of decision trees. doi:https://doi.org/10.48550/arxiv.1812.02207

Mason, T. B., & Lewis, R. J. (2015). Minority stress and binge eating among lesbian and bisexual women. *Journal of Homosexuality*, *62*(7), 971–992. https://doi.org/10.1080/00918369.2015.1008285

Mikhail, M. E., Carroll, S. L., Clark, D. A., O'Connor, S., Burt, S. A., & Klump, K. L. (2021). Context matters: Neighborhood disadvantage is associated with increased disordered eating and earlier activation of genetic influences in girls. *Journal of Abnormal Psychology*, *130*(8), 875–885. https://doi.org/10.1037/ABN0000719

Neumark-Sztainer, D., Croll, J., Story, M., Hannan, P. J., French, S. A., & Perry, C. (2002). Ethnic/racial differences in weight-related concerns and behaviors among adolescent girls and boys: Findings from project EAT. *Journal of Psychosomatic Research*, *53*(5), 963–974. http://www.ncbi.nlm.nih.gov/pubmed/12445586

Neumark-Sztainer, D., Story, M., Hannan, P. J., Perry, C. L., & Irving, L. M. (2002). Weight-related concerns and behaviors among overweight and nonoverweight adolescents. *Archives of Pediatrics & Adolescent Medicine*, *156*(2), 171–178. https://doi.org/10.1001/archpedi.156.2.171

Neumark-sztainer, D., Wall, M. M., Larson, N., et al. (2012). Secular trends in weight status and weight-related attitudes and behaviors in adolescents from 1999 to 2010. *Preventive Medicine*, *54*(1), 77–81. https://doi.org/10.1016/j.ypmed.2011.10.003.Secular

Neumark-Sztainer, D., Wall, M. M., Larson, N. I., Eisenberg, M. E., & Loth, K. (2011). Dieting and disordered eating behaviors from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Journal of the American Dietetic Association*, *111*(7), 1004–1011.

O'Brien, K. S., Latner, J. D., Puhl, R. M., et al. (2016). The relationship between weight stigma and eating behavior is explained by weight bias internalization and psychological distress. *Appetite*, *102*, 70–76. https://doi.org/10.1016/J.APPET.2016.02.032

Pernick, Y., Nichols, J. F., Rauh, M. J., et al. (2006). Disordered eating among a multi-racial/ethnic sample of female high-school athletes. *Journal of Adolescent Health*, *38*(6), 689–695. https://doi.org/10.1016/J.JADOHEALTH.2005.07.003

Poll, K. L., Holben, D. H., Valliant, M., & Joung, H. D. (2020). Food insecurity is associated with disordered eating behaviors in NCAA division 1 male collegiate athletes. *Journal of American College Health*, *68*(2), 105–109. https://doi.org/10.1080/07448481.2018.1529035

Pritchard, M., Elgin, J., & Pritchard, M. (2006). Gender differences in disordered eating and its correlates. *Eating and Weight Disorders*, *11*, 96–101.

Puhl, R. M., Andreyeva, T., & Brownell, K. D. (2008). Perceptions of weight discrimination: Prevalence and comparison to race and gender discrimination in America. *International Journal of Obesity*, *32*, 992–1000. https://doi.org/10.1038/ijo.2008.22

Puhl, R. M., Neumark-Sztainer, D., Austin, S. B., Luedicke, J., & King, K. M. (2014). Setting policy priorities to address eating disorders and weight stigma: Views from the field of eating disorders and the US general public. *BMC Public Health*, *14*(1), 1–10. https://doi.org/10.1186/1471-2458-14-524

Richardson, T., Elliott, P., Waller, G., & Bell, L. (2015). Longitudinal relationships between financial difficulties and eating attitudes in undergraduate students. *The International Journal of Eating Disorders*, *48*(5), 517–521. https://doi.org/10.1002/EAT.22392

Shim, R., Koplan, C., Langheim, F. J. P., Manseau, M. W., Powers, R. A., & Compton, M. T. (2014). The social determinants of mental health: An overview and call to action. *Psychiatric Annals*, *44*(1), 22–26. https://doi.org/10.3928/00485713-20140108-04

Simone, M., Emery, R. L., Hazzard, V. M., Eisenberg, M. E., Larson, N., & Neumark-Sztainer, D. (2021). Disordered eating in a population-based sample of young adults during the COVID-19 outbreak. *The International Journal of Eating Disorders*, *54*(7), 1189–1201. https://doi.org/10.1002/eat.23505

Simone, M., & Lockhart, G. (2016). Two distinct mediated pathways to disordered eating in response to weight stigmatization and their application to prevention programs. *Journal of American College Health*, *64*(7), 520–526. https://doi.org/10.1080/07448481.2016.1188106

Smyth, J. M., Wonderlich, S. A., Heron, K. E., Sliwinski, M. J., Crosby, R. D., Mitchell, J. E., & Engel, S. G. (2007). Daily and momentary mood and stress are associated with binge eating and vomiting in bulimia nervosa patients in the natural environment. *Journal of Consulting and Clinical Psychology*, *75*(4), 629–638. https://doi.org/10.1037/0022-006X.75.4.629

Strobl, C., Malley, J., & Tutz, G. (2009). An introduction to recursive partitioning: Rationale, application, and characteristics of classification and regression trees, bagging, and random forests. *Psychological Methods*, *14*(4), 323–348. https://doi.org/10.1037/a0016973

Taylor, E. A., Foster, J. S., & Mobley, A. R. (2020). A qualitative investigation of body weight and weight loss-related attitudes of mothers and fathers in the context of food insecurity. *Eating and Weight Disorders*, *25*(6), 1663–1669. https://doi.org/10.1007/S40519-019-00804-7

Team Rs. RStudio: Integrated Development Environment for R.; 2022. http://www.rstudio.com/

Tester, J. M., Lang, T. C., & Laraia, B. A. (2016). Disordered eating behaviours and food insecurity: A qualitative study about children with obesity in low-income households. *Obesity Research & Clinical Practice*, *10*(5), 544–552. https://doi.org/10.1016/J.ORCP.2015.11.007

Thornton, R. L. J., Glover, C. M., Cené, C. W., Glik, D. C., Henderson, J. A., & Williams, D. R. (2016). Evaluating strategies for reducing health disparities by addressing the social determinants of health. *Health Affairs*, *35*(8), 1416–1423. https://doi.org/10.1377/HLTHAFF.2015.1357

Volpe, U., Tortorella, A., Manchia, M., Monteleone, A. M., Albert, U., & Monteleone, P. (2016). Eating disorders: What age at onset? *Psychiatry Research*, *238*, 225–227. https://doi.org/10.1016/j.psychres.2016.02.048

Watson, L. B., Velez, B. L., Brownfield, J., & Flores, M. J. (2016). Minority stress and bisexual Women's disordered eating: The role of maladaptive coping. *The Counseling Psychologist*, *44*(8), 1158–1186. https://doi.org/10.1177/0011000016669233

Yanovski, S. Z. (1993). Binge eating disorder: Current knowledge and future directions. *Obesity Research*, *1*(4), 306–324. https://doi.org/10.1002/j.1550-8528.1993.tb00626.x

Yoon, C. Y., Hazzard, V. M., Emery, R. L., Mason, S. M., & Neumark-Sztainer, D. (2022). Everyday discrimination as a predictor of maladaptive and adaptive eating: Findings from EAT 2018. *Appetite*, *170*, 105878. https://doi.org/10.1016/j.appet.2021.105878

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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