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Unpacking the complexities in racial and ethnic discrimination and tobacco use and cannabis co-use behaviors among young adults in the U.S.

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ABSTRACT

Introduction: There is a general paucity of research describing the relationship between racial and ethnic discrimination (RED) and coping strategies on use of little filtered cigars and cigarillos (LCCs) across racial and ethnic identities. This research sought to unravel some of the complex, multilayered experiences of RED and subsequent coping strategies to examine the impact on LCC use.
Methods: Data come from a cross-sectional survey conducted among a nationally representative sample of U.S. young adults (n = 1,178) in May 2022. Respondents were asked about their exposure to LCC marketing (systemic RED), interpersonal experiences of RED, coping strategies, and use of LCCs as-sold (tobacco only) or as a blunt (with marijuana). Multivariable logistic regression was used to examine odds of LCC use examining systemic and interpersonal RED and the relationship between emotion-focused and problem-focused coping strategies among those who have experienced RED.
Results: Exposure to systemic RED was associated with increased odds of blunt use. Interpersonal experiences of RED were associated with increased odds of LCC use as-sold and as blunts. Among those who experienced any RED, the impact of problem-focused and emotion-focused coping was differential across racial and ethnic identities in the impact on LCC use modality.
Conclusion: Systemic and interpersonal RED are independently associated with LCC use. There are considerable differences in how young adults cope with RED which necessitates additional research to further elucidate the complex pathways between RED and product use to more effectively inform strategies to address the undeniable racial and ethnic inequities in tobacco-related health outcomes.

1. Introduction

In 2021, the United States (U.S.) declared racism a public health crisis (Hayes, 2021). The declaration came parallel with the global COVID-19 pandemic which disproportionately impacted communities of color and exacerbated existing systemic inequities that contribute to increasing disparities in health (Irizar et al., 2023; Isath et al., 2023). Targeted tobacco marketing is one manifestation of systemic racism that operates on multiple levels exploiting vulnerable populations and perpetuating tobacco-related health disparities. An analysis of internal tobacco industry documents demonstrates decades of pervasive marketing intentionally targeted toward Black or African American neighborhoods (Yerger et al., 2007). Despite the abundance of research illuminating these predatory marketing practices and their subsequent impact on the health of these communities, tobacco control has not rectified the problem (Cwalina et al., 2023). Combustible tobacco products, particularly little filtered cigars and cigarillos (LCCs), continue to be disproportionately available in communities of color (Giovenco et al., 2018; Smiley et al., 2019) and intentionally marketed towards young, minoritized populations in conventional and digital media (Donaldson et al., 2022; Ganz et al., 2022; Tan et al., 2021) thus putting them at greater risk of use and subsequent tobacco-related health outcomes (Chen-Sankey et al., 2021b; Dunn et al., 2021; Garrett et al., 2016; Tan et al., 2021).

Racial and ethnic discrimination (RED), an expression of racism, is complex and multidimensional. The experience of RED, whether at the

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individual, interpersonal or institutional level, has been demonstrated to have significant harmful effects on physical and mental health among communities of color (Carter et al., 2017; Paradies et al., 2015). In examining tobacco-related behaviors, the experience of RED has been repeatedly shown to contribute to use of cigarettes (Borrell et al., 2010; Brondolo et al., 2015; Chae et al., 2008; Hicks and Kogan, 2020; Nguyen et al., 2012; Rose et al., 2019) as well as use and co-use of cannabis particularly among Black/African American and Hispanic/Latinx populations across the lifespan (Mattingly et al., 2023; Rose et al., 2019). Importantly, the relationship between the experience of RED and subsequent use of tobacco and/or cannabis has been shown to be modified by exposure to targeted marketing, a form of systemic racism, highlighting the importance of considering both when evaluating key exposures leading to tobacco use and cannabis co-use (Rose et al., 2019).

Despite the well-documented relationship between RED and use of cigarettes, the relationship with other commercial tobacco products, particularly LCCs, remains understudied. LCCs are not used in the same way as cigarettes. They are less likely to be consumed entirely in a single setting, more likely to be used in social contexts, and are frequently used to co-administer cannabis in the form of a blunt (Antognoli et al., 2018). Blunts, which are often made by removing some or all of the interior tobacco in an LCC and replacing it with loose leaf cannabis, are one of the most prevalent forms of tobacco-cannabis co-use among young adults (Pike Moore et al., 2023). Furthermore, LCCs are often considered a dynamic complement such that those who use them are at greater risk of multiple tobacco product use and cannabis co-use (Sterling et al., 2016; Sterling et al., 2022) particularly young adults who identify as Black/African American or Hispanic/Latinx (Chen-Sankey et al., 2021a; Phan et al., 2021).

The relationship between RED and use of tobacco and/or cannabis co-use may be explained, in part, by the significant psychological distress brought on by these oppressive experiences (Lorenzo-Blanco and Unger, 2015; Purnell et al., 2012) and how individuals may cope with the distress. Coping represents cognitive and behavioral efforts that are intended to address internal and external demands brought on by a stressor (Folkman, 2013). Coping with the stress of RED can manifest in various ways, each with distinct impacts on mental health outcomes and related health behaviors. Efforts to cope can include problem-focused strategies (i.e. engaging in education or activism, resistance) and/or emotion-focused strategies (i.e. detachment, internalization). Emotion-focused coping strategies, particularly those related to disengagement or avoidance, have been demonstrated to contribute to poorer mental health outcomes (Evans et al., 2015) while problem-focused strategies may mitigate a portion of the stress associated with RED (Mekawi et al., 2022) and thus reduce the likelihood of turning to substances like tobacco and/or cannabis as a means of coping. However, there is limited research on how coping strategies may contribute specifically to tobacco use and/or cannabis co-use behaviors among individuals experiencing RED.

This purpose of this research was to begin to unravel the complex intersection between RED and coping by taking steps to disentangle mechanisms that may be pertinent specifically to the use of LCCs as a distinct form of tobacco use and/or cannabis co-use which is replete in the literature. We hypothesized that 1) RED both at the systemic and interpersonal level may contribute to greater odds of use of LCCs with just tobacco (as-sold) as well as those co-administered with cannabis as a blunt and 2) emotion-focused strategies to cope with interpersonal RED may contribute to greater use of LCCs.

2. Methods

2.1. Study population

Survey data are from a sample population of young adults in the U.S., aged 18–36 years (N = 1,178) collected in May 2022. This sample comes from the National Opinion Research Center at the University of Chicago AmeriSpeak® panel as part of the C'RILLOs Project. The panel utilizes an address-based sampling frame designed to be nationally representative of households in the U.S. Panel base sampling weights, which were calculated as the inverse probability of selection, were adjusted to account for unknown eligibility and non-response at the household level such that each eligible adult within each household was assigned a post-stratification weight. A person-level non-response adjustment was applied for nonresponding, eligible adults within each recruited household. The final panel weights were then raked to the external population based on age, sex, education, race and ethnicity, housing tenure, telephone status, and geography (e.g., Census Division). Given the high prevalence of LCC use among non-Hispanic Black (NHB) and Hispanic (HIS) populations (Chen-Sankey et al., 2021a), this sample also includes an oversample of these racial and ethnic identities. Specific to this study, base sampling weights were derived from the final panel weight and probability of selection adjusting for non-response. Survey data were thus weighted to the U.S. general young adult population. Within race and ethnicity-stratified analyses, or those included in the oversample, non-response adjusted weights were subsequently adjusted using a raking ratio to the U.S. population benchmarks for those aged 18–34 among HIS, NHB, and NHW/NHO. Sampling weights were then re-raked based on age, gender, education, and census region based on the Current Population Survey. All participants provided informed consent and study procedures were approved by the University of Texas Health Science Center's Institutional Review Board.

2.2. Primary dependent variable: use of LCCs

Respondents were asked if they had ever used little cigars or cigarillos (LCCs) either 'as-sold' or 'with marijuana as a blunt.' Respondents who had indicated use were subsequently asked how recently they had last used LCCs. Respondents who reported LCC use within the past 30-days were included in the analysis as individuals who had used LCCs as-sold or as a blunt.

2.3. Independent variables

2.3.1. Systemic Racial and Ethnic Discrimination (RED): exposure to LCC marketing

Given the substantial degree to which NHB and HIS populations are targeted by the tobacco industry across multiple media types including print (Ganz et al., 2022) and social media (Heley et al., 2023; Kostygina et al., 2016), exposure to LCC marketing represents an important form of systemic RED that cannot be excluded from consideration given prior research demonstrating effect modification between the experience of interpersonal RED and independent tobacco and cannabis product use (Rose et al., 2019). To capture exposure to marketing, respondents were asked "In the past 30 days, have you noticed little cigars or cigarillos being advertised in any of the following places?" Response options included at gas stations, convenience stores, or other retail stores (retail settings), in newspapers or magazines (print media) on television or radio, on websites or social media sites (social media), at events such as fairs, festivals or sporting events or nightclubs, bars or concerts (events or local venues), or somewhere else. Respondents who indicated that they had seen advertising in any of the listed forms or somewhere else in the past 30 days were aggregated to assess broad exposure to LCC marketing.

2.3.2. Interpersonal experience of racial and ethnic discrimination

Respondents' experiences with interpersonal RED were measured using an adapted version of the Perceived Ethnic Discrimination Questionnaire (PEDQ) (Brondolo et al., 2005) which consists of 17 items that measure lifetime exposure to discrimination across four subscales and a single-response item: Exclusion or Rejection (e.g., "Because of your race/ethnicity, how often have others ignored you or not paid attention to you?"), Stigmatization or Devaluation (e.g., "Because of your race/

ethnicity, how often has it been hinted that you must be lazy?"), Discrimination at Work or School (e.g., "Because of your race/ethnicity, how often have others thought you couldn't do things or handle a job?"), Threat or Aggression (e.g., "Because of your race/ethnicity, how often have others threatened to hurt you (ex: said they would hit you)?"), and Race-Based Maltreatment from Police (e.g., "Because of your race/ethnicity, how often have policeman or security officers been unfair to you?"). Each response item was measured on a 5-item scale ranging from 1 (Never Happened) to 5 (Always Happens) and an average was calculated across all 17 items. Individuals who were missing than 1 response within each subscale were excluded from analysis (n = 37). Reliability in this sample was high for the overall PEDQ with a Cronbach's alpha = 0.97 and across each subscale (Exclusion or Rejection = 0.88; Stigmatization or Devaluation = 0.91; Discrimination at Work or School = 0.89; Threat or Aggression = 0.91).

2.3.3. Coping with racial and ethnic discrimination

Among those who experienced any form of RED, the Coping with Discrimination Scale (CDS) (Wei et al., 2010) was used to assess how respondents cope with it.. The CDS consists of 25 items across five subscales: Education and Advocacy (e.g., "I try to educate people so that they are aware of discrimination"), Internalization (e.g., "I wonder if I did something to provoke this incident"), Drug and Alcohol Use (e.g., "I try to stop thinking about it by taking alcohol or drugs", Resistance (e.g., "I directly challenge the person who offended me"), and Detachment ("It's hard for me to seek emotional support from other people"). Each response was measured on a 6-item scale ranging from 1 (Never like me) to 6 (Always like me). Items that were negatively presented (e.g., "I do not…") were reverse coded to ensure item comparability.

In this research, emotion-focused strategies were quantified combining the average item score from the subscales for both Internalization and Detachment while problem-focused strategies were quantified using the subscale scores for both Education and Advocacy and Resistance. Items pertaining to Drug and Alcohol Use were excluded from these strategies due to the potential interpretation of these items as potential alternative outcome that are highly correlated to the main outcomes of this study, particularly use of blunts. Individuals missing 2 or more responses to items across each subscale were excluded from analyses related to coping (n = 15). Reliability across these combined subscales in this sample was acceptable based on Cronbach's alpha (Emotion-Focused = 0.83; Problem-Focused = 0.77).

2.3.4. Sociodemographic characteristics

Race and ethnicity were a key factor of interest in this study to explore variability in exposure to systemic and interpersonal RED. Racial and ethnic groups included non-Hispanic White (NHW), non-Hispanic Black (NHB), non-Hispanic Asian (NHA), non-Hispanic Multiracial (NHM), and Hispanic (HIS)). Individuals who did not identify as any of these racial and ethnic groups (e.g., non-Hispanic Other) were excluded from stratified analyses as the classification did not represent a meaningful racial or ethnic identity. Other sociodemographic characteristics which have been shown to be associated with use of LCCs (Sterling et al., 2022) include respondents' self-reported age, gender (male, female), sexual orientation (heterosexual/straight, homosexual/gay or lesbian, bisexual), and educational attainment (high school or less, vocational/technical school/some college/Associate degree, Bachelor degree or more).

2.4. Analysis

Multivariable logistic regression models were used to model the likelihood of using LCCs as-sold or as blunts examining for the impact of independent predictors including exposure to LCC marketing, experience of interpersonal RED. Analyses controlled for key sociodemographic characteristics (gender, age, sexual orientation, and educational attainment) which have been shown to be associated with use of LCCs (Sterling et al., 2022). Analyses were weighted to the U.S. general young adult population.

To explore the impact of various coping strategies among those who have experienced any form interpersonal RED (average PEDQ score greater than 1 (Never Happened), separate multivariable logistic regression models were conducted for those racial and ethnic groups included study's oversample (NHB and HIS) due to effect modification that was observed between coping strategies and subsequent use of LCCs by racial and ethnic identity. These models examined perceived experience of interpersonal RED and exposure to LCC marketing as a form of systemic racism. Models were adjusted for covariates found to be associated with use of LCCs in the previous models. Statistical models used a Bonferroni correction to adjust for the number of tests conducted. All analyses were conducted using SAS (v9.4).

3. Results

Respondents were predominantly between the ages of 25 and 36 (69.4 %), identified as heterosexual (84.4 %) and about half (50.3 %) were male (Table 1). Just over half were identified as NHW (54.4 %), HIS (22.2 %) or NHB (13.1 %). Nearly two-thirds (63.3 %) reported having seen any advertisements for LCCs in the past 30 days. In examining the prevalence of LCC use in the past 30 days, 16.2 % reported having used any type of LCCs, 12.8 % reporting modifying LCCs as a blunt and 7.3 % reporting LCC use as-sold. Across the study sample, the average PEDQ score representing the experience of RED was 1.68 (SD: 0.82) with the Exclusion/Rejection subscale having the greatest value (1.85, SD: 0.94). Among those who experienced any form of RED, or where the composite PEDQ score was greater than 1, young adults were more likely to report use of problem-focused coping compared to emotion-focused strategies (Mean (M) = 2.84, Standard Deviation(SD) = 0.80,M = 2.64, SD = 0.87, respectively).

The prevalence of past 30-day exposure to LCC marketing was greatest among HIS (69.4 %), NHB (69.1 %), and NHM (68.0 %) young adults (Supplemental Fig. 1). While the primary source of exposure across all racial and ethnic groups was retail settings, there were minor differences in sources of the marketing exposure across race and ethnicity.

NHB respondents reported the greatest levels of overall perceived experiences of RED (M = 2.14; 95 % CI: 2.01, 2.60) followed by NHM (M = 1.96; 95 % CI: 1.73, 2.18), NHA (M = 1.87; 95 % CI:1.73, 2.01), and HIS (M = 1.76; (95 % CI:1.65, 1.88) (Supplemental Fig. 2). Among those who reported any RED, there were minimal differences between emotion-focused and problem-focused strategies across racial and ethnic identities (Supplemental Fig. 3).

Structural discrimination, as measured by exposure to LCC marketing, and interpersonal RED, as measured by the PEDQ, demonstrate that each of these factors independently contribute to greater odds of use for both LCCs as-sold and as a blunt (Table 2). In the multivariate logistic regression model, young adult participants who identified as NHB were 2.78 times as likely (95 % CI: 1.55, 4.98) to use LCCs as-sold and 1.87 times as likely (95 % CI: 1.12, 3.12) to use blunts compared to NHW young adults. No differences were observed for other racial and ethnic identities. Young adults who identified as female were 0.46 times as likely (95 % CI: 0.29, 0.74) to use LCCs as-sold compared to males, though no differences were observed for LCCs as blunts. Exposure to LCC advertisements was associated with 2.36 times the odds (95 % CI: 1.46, 3.82) of blunt use compared to individuals who were not exposed to advertisements though no association was observed for use of LCCs as-sold. Across both LCC use modalities, the perceived experience of interpersonal RED was associated with greater odds of LCC use both as-sold (1.58, 95 % CI: 1.20, 2.07) and as a blunt (1.27, 95 % CI: 1.02, 1.60). Educational attainment was a protective factor across all product groups contributing to reduced odds of past 30-day use of LCCs. No differences were observed by sexual orientation.

In examining the relationship between coping strategies among

Table 1
Characteristics of young adults in the U.S who have used little filtered cigars or cigarillos in the past 30-days (N = 1,178).

	Full Sample		Use of Little Cigars and Cigarillos (LCCs)					
			As-Sold (Tobacco Only)		As Blunt (With Marijuana)		Any LCC Use	
	N = 1,178		n = 95 (7.4 %)		n = 167 (12.9 %)		n = 208 (16.3 %)	
	n	%	row %		row %		row %	
Age								
18–24	292	30.5	6.2		10.4		14.0	
25–36	886	69.5	7.8		13.9		17.3	
Gender								
Male	553	50.3	9.9		12.7		17.6	
Female	625	49.7	4.7		13.0		14.9	
Race and Ethnicity[a]								
Non-Hispanic White	527	54.2	5.0		9.5		11.7	
Non-Hispanic Black	208	13.7	19.1		25.8		36.2	
Non-Hispanic Asian	115	8.1	5.8		6.0		11.1	
Non-Hispanic Multiracial	65	1.5	11.1		11.1		16.0	
Hispanic	241	22.1	5.9		15.3		16.8	
Sexual Orientation								
Heterosexual/Straight	927	84.4	7.4		12.4		16.3	
Gay or Lesbian	63	6.6	9.2		15.2		16.8	
Bisexual	111	9.0	7.3		18.0		18.6	
Educational Attainment								
High School or Less	355	37.7	12.9		19.7		24.7	
Some College or Technical School	458	32.1	6.5		11.2		15.3	
Bachelor's or More	365	30.1	1.3		6.1		6.7	
Exposure to Advertising								
Seen LCC Advertisements	750	63.3	8.9		16.4		20.1	
Not Seen LCC Advertisements	424	36.7	4.7		6.9		9.8	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Lifetime Exposure to Racial or Ethnic Discrimination[b]	1.68	0.82	2.12	0.80	1.94	0.88	1.96	0.85
Exclusion/Rejection	1.85	0.94	2.29	0.96	2.09	0.97	2.11	0.98
Stigmatization/Devaluation	1.61	0.88	2.05	0.97	1.83	0.96	1.88	0.97
Discrimination at Work/School	1.77	0.93	2.15	0.95	2.04	0.95	2.04	0.96
Threat/Aggression	1.53	0.78	1.77	0.77	1.76	0.89	1.72	0.85
Unfair Treatment by Police	1.67	1.09	2.18	1.17	2.17	1.24	2.09	1.20
Coping with Discrimination[c]								
Emotion-Focused Coping	2.64	0.87	2.85	0.88	2.62	0.83	2.68	0.89
Problem-Focused Coping	2.84	0.80	3.07	0.86	2.83	0.78	2.94	0.84

Data Note: All data are weighted to the U.S. young adult population. All n's presented are unweighted. M = Mean; SD=Standard deviation

[a] Individuals who did not identify as any of these races or ethnicities were combined into a single category for non-Hispanic Other which was excluded from presentation of racial and ethnic analyses as it does not represent a meaningful classification.

[b] Measure based on the Perceived Ethnic Discrimination Questionnaire (PEDQ) where scores range from 1 (Never Happened) to 5 (Always Happened).

[c] Measured based on the Coping with Discrimination Scale where scores range from 1 (Never Like Me) to 6 (Always Like Me). Emotion-focused coping includes subscale scores for Detachment and Internalization. Problem-focused coping includes subscale scores for Education and Advocacy and Resistance. Coping scores are only included among those who reported having an overall PEDQ score greater than 1.

those who reported any experience of RED, there was a significant interaction between coping strategies and racial and ethnic identity. Among NHB young adults, those who reported greater levels of problem-focused coping strategies had greater odds of having used blunts (1.78, 95 % CI: 1.11, 2.87) but not use of LCCs as-sold after controlling for covariates (Table 3). Contrarily, HIS young adults who reported greater levels of problem-focused strategies reported greater odds of having used LCCs as-sold (4.92, 95 % CI: 1.72, 14.06) but not use of blunts. In examining the role of emotion-focused strategies, no differences were observed across any LCC use modality among NHB young adults. For HIS young adults, however, use of emotion-focused strategies was associated with greater odds of blunt use (2.12, 95 % CI: 1.15, 3.91). There was no impact of the reported magnitude of the PEDQ scale on use of LCCs nor did exposure to marketing impact LCC use with one exception. NHB young adults had 7.73 times the odds of blunt use (95 % CI: 2.10, 28.40) when exposed to LCC marketing though the wide confidence interval suggests substantial variability among respondents.

Educational attainment had protective effects that were similarly different across these two racial and ethnic groups. Greater educational attainment for NHB young adults resulted in reduced odds of LCC use as-sold (0.47, 95 % CI: 0.26, 0.86) but had no protective effect on blunt use. Greater educational attainment for HIS young adults resulted in reduced odds of blunt use (0.38, 95 % CI: 0.18, 0.78) but had no protective effect on use of LCCs as-sold.

4. Discussion

The overarching findings underscore the intricate and multifaceted

Table 2
Predictors past 30-day little filtered cigar and cigarillo (LCC) use among young adults in the U.S., 2022 (n = 1,049).

	Use of LCCs As-Sold (Tobacco Ony)				Use of LCCs As Blunts (With Marijuana)			
	Unadj. OR	95 % CI	Adj OR	95 % CI	Unadj. OR	95 % CI	Adj. OR	95 % CI
Gender								
Female	0.46	0.29, 0.74	0.56	0.34, 0.94	1.04	0.74, 1.47	1.10	0.74, 1.61
Male	*Referent*		*Referent*		*Referent*		*Referent*	
Sexual Orientation								
Gay or Lesbian	1.27	0.55, 2.92	1.12	0.47, 2.67	1.28	0.66, 2.50	0.64	0.28, 1.45
Bisexual	0.99	0.45, 2.20	0.60	0.24, 1.53	1.57	0.91, 2.71	1.29	0.71, 2.35
Heterosexual / Straight	*Referent*		*Referent*		*Referent*		*Referent*	
Age	1.0	0.96, 1.04	1.03	0.98, 1.09	1.01	0.98, 1.05	1.06	1.02, 1.10
Race and Ethnicity								
Non-Hispanic Black	4.51	2.65, 7.66	2.78	1.55, 4.98	3.31	2.13, 5.14	1.87	1.12, 3.12
Non-Hispanic Asian	1.17	0.46, 2.98	0.16	0.01, 1.83	0.61	0.25, 1.48	0.59	0.22, 1.60
Non-Hispanic Multiracial	2.38	0.51, 11.18	2.22	0.39, 12.67	1.19	0.26, 5.47	0.95	0.18, 5.15
Hispanic	1.20	0.64, 2.25	0.88	0.44, 1.76	1.72	1.12, 2.64	1.33	0.84, 2.11
Non-Hispanic White	*Referent*		*Referent*		*Referent*		*Referent*	
Educational Attainment	0.35	0.25, 0.50	0.38	0.26, 0.87	0.51	0.40, 0.64	0.50	0.38, 0.65
Exposure to LCC Marketing	1.98	1.19, 3.30	1.87	1.00, 3.52	2.65	1.74, 4.03	2.36	1.46, 3.82
Lifetime Exposure to Racial or Ethnic Discrimination[a]	1.79	1.41, 2.27	1.58	1.20, 2.07	1.48	1.22, 1.80	1.27	1.02, 1.60

Data Note: Results presented for unadjusted and adjusted multivariable logistic regression models. All data are weighted to be representative of the U.S. young adult population. A Bonferroni correction was applied to account for multiple statistical testing. OR=Odds Ratio.

[a] Measure based on the Perceived Ethnic Discrimination Questionnaire (PEDQ) where scores range from 1 (Never Happened) to 5 (Always Happened).

Table 3
Predictors of past 30-day use of little filtered cigar and cigarillo (LCC) use among non-hispanic black and hispanic young adults in the U.S. who have experienced racial or ethnic discrimination, 2022.

	Use of LCCs As-Sold (Tobacco Ony)				Use of LCCs As Blunts (With Marijuana)			
	Unadj. OR	95 % CI	Adj. OR	95 % CI	Unadj. OR	95 % CI	Adj. OR	95 % CI
Non-Hispanic Black (n = 175)								
Female (ref = Male)	0.64	0.32, 1.31	0.94	0.42, 2.09	1.14	0.59, 2.21	0.79	0.35, 1.78
Educational Attainment	0.41	0.24, 0.71	0.47	0.26, 0.86	0.79	0.51, 1.22	0.95	0.55, 1.63
Exposure to LCC Marketing	1.93	0.83, 4.52	1.31	0.51, 3.39	2.27	1.01, 5.10	7.73	2.10, 28.40
Lifetime Exposure to Racial or Ethnic Discrimination[a]	1.37	0.90, 2.10	1.28	0.75, 2.18	1.18	0.78, 1.79	1.16	0.69, 2.00
Emotion-Focused Coping[b]	1.15	0.79, 1.66	0.99	0.63, 1.56	0.72	0.50, 1.04	0.65	0.40, 1.03
Problem-Focused Coping[b]	1.40	0.95, 2.06	1.28	0.82, 2.00	1.78	1.20, 2.64	1.78	1.11, 2.87
Hispanic (n = 184)								
Female (ref = Male)	0.16	0.03, 0.83	0.03	0.00, 0.32	0.79	0.36, 1.72	0.70	0.30, 1.63
Educational Attainment	0.62	0.26, 1.49	0.45	0.14, 1.44	0.40	0.21, 0.78	0.38	0.18, 0.78
Exposure to LCC Marketing	1.03	0.29, 3.72	0.69	0.13, 3.36	1.26	0.52, 3.09	0.75	0.27, 2.05
Lifetime Exposure to Racial or Ethnic Discrimination[a]	2.09	1.16, 3.76	2.18	0.84, 5.66	1.25	0.83, 1.89	0.82	0.45, 1.51
Emotion-Based Coping[b]	1.29	0.65, 2.54	0.49	0.16, 1.51	1.82	1.14, 2.91	2.12	1.15, 3.91
Problem-Focused Coping[b]	3.12	1.41, 6.91	4.92	1.72, 14.06	0.97	0.59, 1.62	0.88	0.47, 1.64

Data Note: All data are weighted to be representative of the specified race and ethnicity. A Bonferroni correction was applied to account for multiple testing. OR=Odds Ratio.

[a] Measure based on the Perceived Ethnic Discrimination Questionnaire (PEDQ) where scores range from 1 (Never Happened) to 5 (Always Happened). Analysis includes those who reported having an overall PEDQ score greater than 1.

[b] Measured based on the Coping with Discrimination Scale where scores range from 1 (Never Like Me) to 6 (Always Like Me). Emotion-focused coping includes subscale scores for Detachment and Internalization. Problem-focused coping includes subscale scores for Education and Advocacy and Resistance. Coping scores are only included among those who reported having an overall PEDQ score greater than 1.

nature of RED. Much like peeling back the layers of an onion, the complex interplay between factors at the systemic and interpersonal level reveals stark and nuanced differences. This research highlights substantial variability across racial and ethnic identities reflecting differences in how young adults both experience systemic and interpersonal RED and subsequently cope with their lived experiences. There remains an imperative for both future research and intervention work to develop impactful racial- or ethno-specific strategies to address these inequities across multiple levels.

This research illuminates racial and ethnic differences in how various strategies employed to cope with the experience of discrimination may impact LCC use. HIS young adults who used emotion-focused strategies were at greater odds of blunt use which aligns with literature showing that emotion-focused strategies are associated with poor psychological outcomes. such as distress (Sosoo et al., 2020) which may subsequently increase risk of tobacco-cannabis co-use (Mattingly et al., 2024). However, this association was not observed among NHB young adults. In examining the association between emotion-focused strategies and use of LCCs as-sold, no differences were observed among NHB or HIS young adults which may reflect a key difference in LCC use modality.

Use of problem-focused strategies was associated with higher odds of LCC use but these strategies were different in their impact LCC use modality with HIS being at greater odds of use of LCC as-sold and NHB being at greater odds of blunt use. This diverges from previous research

demonstrating that problem-focused strategies may represent a form of proactive coping particularly among those who have a greater sense of cultural socialization which has a positive impact on mental health (Jones et al., 2020; Salcido and Stein, 2024). A potential explanation for this unexpected finding could be the physical and emotional burdens associated with engaging in problem-focused strategies (Galovski et al., 2016) in addition to potential repercussions (e.g., retaliation, becoming a target for violence) which can contribute to higher levels of emotional burnout (Gorski, 2019). Regardless, the differences observed between NHB and HIS young adults with respect to LCC use modality further emphasizes the need to explore contextual differences in RED as well as important cultural differences in coping styles.

While psychological stress and distress related to the experience of RED have been shown to contribute to poorer physical and mental health outcomes (Borrell et al., 2010; Brondolo et al., 2015; Chae et al., 2008; Hicks and Kogan, 2020; Nguyen et al., 2012; Rose et al., 2019), a primary limitation of this research was a lack of mental health measures available for analysis. It is likely that mental health outcomes may mediate the relationship between the experience of RED and use of tobacco and/or cannabis co-use (Jones et al., 2022; Mattingly et al., 2023). An important finding from this research highlights that NHB and HIS young adults who experience any form of interpersonal RED, the magnitude of RED was not associated with LCC use when controlling for coping and other covariates. This in turn highlights the significant complexity in the path from the exposure to the subsequent outcome, or use of LCCs wherein mental health symptomology may play a crucial role in the pathway(s). However, there is limited research that fully engenders these complex pathways highlighting an opportunity for future research.

In this representative sample of young adults, there were racial and ethnic differences in exposure to LCC advertising in the past 30-days with NHB and NHM young adults reporting a higher prevalence of marketing exposure compared to other racial and ethnic groups which is supported by the literature (Giovenco et al., 2018; Kong et al., 2020; Primack et al., 2007; Rose et al., 2022; Tan et al., 2021; Yerger et al., 2007). Findings also suggest that both exposure to LCC marketing as a form of systemic RED and the experience of interpersonal RED are both independently associated with greater use of tobacco and/or cannabis co-use which similarly contributes to a growing body of literature (Hacker et al., 2023; Jackson et al., 2023; Mattingly et al., 2023; Rose et al., 2019). However, in examining the role of marketing among NHB and HIS young adults who experienced any form of interpersonal RED suggests that marketing was only associated with increased odds of blunt use among NHB young adults. This is important within the context of growing adoption of restrictions on availability and marketing of tobacco products available with characterizing flavors and a simultaneous market shift showing a rise in sales of non-characterizing concept flavors (Delnevo et al., 2021). Shifts in LCC marketing demonstrate increased co-marketing of cannabis as well as lifestyle characteristics rather than what was previously a preponderance of characterizing flavor-based marketing and packaging (Pike Moore et al., 2024; Silver et al., 2022). A 2017 study examining LCCs available in retailers near schools in California suggests that 62 % of stores had at least of one form of cannabis co-marketing and half (53.2 %) sold at least one LCC marketed specifically as a blunt wrap, or hollowed tube or sheet that does not include interior tobacco (Henriksen et al., 2018). Findings from a 2022 content analysis of direct-to-mail advertisements highlight key features that may appeal specifically to Black/African American audiences including social contexts or settings associated with the Black/African American experience or creative activity associated with prominent artists in the Black/African American community (Silver et al., 2022). Taken together, racially targeted marketing specifically to Black/African American populations and the prominence of cannabis co-marketing may explain this observation.

4.1. Implications

This research has important implications for public health. The findings underscore the importance of examining RED with greater granularity across multiple levels to more broadly encapsulate and contextualize the influence of various personal, interpersonal, cultural, environmental characteristics that may shape product use. With respect to tobacco use and cannabis co-use, a comprehensive prevention and intervention approach should be considered to mitigate the impact of RED on tobacco-related health outcomes. Such approaches should include development and implementation of tobacco control that centers racial and ethnic equity (Cwalina et al., 2023) as well as expansion of educational efforts in diversity, equity, and inclusion across institutions. These preventative efforts may be bolstered by enhancing access to mental health treatment for those who experience racism-related distress or trauma as well as adapting smoking cessation interventions to have a more culturally tailored, racial or ethnic trauma-informed approach may provide an opportunity to reduce the use of tobacco as a means of coping as well as improve cessation outcomes among younger populations.

4.2. Limitations

There are several limitations of this research that should be considered. First, the cross-sectional study design does not allow us to make inference about the relationship between discrimination, coping, and subsequent use of tobacco and/or cannabis co-use. Furthermore, individuals who have experienced RED may not perceive their experiences as discriminatory or be hesitant to describe their experiences as discriminatory and their perceptions may thus depend on the context or other characteristics related to their identity (Oh et al., 2024), which may present a challenge in measurement and quantification of RED. Further research may be needed to explore the contexts of these experiences and the resulting coping mechanisms to fully encapsulate the relationship to tobacco and cannabis co-use behaviors. This research did also not measure other factors, such as social support or racial centrality, which a demonstrated protective against RED and may improve mental health outcomes. Hicks and Kogan (2020) found that, among Black men, the experience of RED has little or no impact on tobacco use in the presence of protective social ties, highlighting the crucial role of support networks. Racial centrality, or the extent to which an individual identifies their racial or ethnic group as a central aspect of their own identity has similarly been shown to reduce the impact of RED and tobacco use (Haeny et al., 2023). Thus, the availability of social resources and access to culturally appropriate support systems may also play a crucial role in shaping coping strategies and substance use behaviors across racial and ethnic identities.

5. Conclusion

There is substantial complexity in the impact of exposure to RED at systemic and interpersonal levels on tobacco use and cannabis co-use behaviors among young adults in the U.S. Among those experiencing RED, there are notable racial and ethnic differences in how coping strategies relate to use of LCCs which necessitates further research to understand and address the complex interplay between the contexts, stressors and exposures, mental health symptomology, and coping strategies across racial and ethnic minorities. By doing so, we may more effectively inform culturally relevant interventions that promote positive mental health and adaptive coping strategies and thus reduce tobacco-related inequities experienced by racially- and ethnically-marginalized populations.

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CRediT authorship contribution statement

Stephanie Pike Moore: Writing – review & editing, Writing – original draft, Formal analysis, Conceptualization. **Craig S. Fryer:** Writing – review & editing, Writing – original draft, Conceptualization. **Eugenia Lee:** Writing – review & editing. **Kymberle L. Sterling:** Writing – review & editing, Writing – original draft, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.abrep.2025.100593.

Data availability

Data will be made available on request.

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