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Cigarillo Flavor in Context: Qualitative Analysis of the Social-Ecological Factors Influencing Cigarillo and Cannabis Co-Use Among Young Adults

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Keywords

cannabis, tobacco, young adults, policy

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Introduction

Combustible tobacco use is prevalent among young adults (YAs; ages 18-24 years) in the United States (US), with 8.5% reporting every day or some day use of a combustible product in 2021 (Cornelius et al., 2023). Although YA prevalence of cigarette smoking is higher (5.3%), 3.1% reported smoking cigars in 2021 (Cornelius et al., 2023). Little cigars and cigarillos (LCCs) represent 80% of cigars (18% little cigars; 62% cigarillos) smoked by adults in the US (Corey et al., 2014). Compared to

older adults, YAs are twice as likely to use LCCs, which are disproportionately used by males, people identifying as Black and non-Hispanic, those with low income and less education, and people who use other tobacco products (Phan et al., 2021).

Cannabis use has increased over time (Mauro et al., 2018) and is highest among YAs (25.9% used in the past month in 2022) compared with other age groups (Substance Abuse and Mental Health Services Administration, 2022). Almost half of YAs who use tobacco in the US co-use tobacco and cannabis; among those who co-use,

75.8% report past 30-day co-use of LCCs and cannabis (Cohn & Chen, 2022). The latter group consists of YAs who concurrently use cannabis and LCCs (43.7%) in the past 30 days and those who smoke blunts (modified cigarillo with tobacco removed and replaced or mixed with cannabis) (56.3%) (Cohn & Chen, 2022).

Smoking cannabis in blunts may increase carbon monoxide exposure compared to smoking cannabis by other means (e.g., joint), and people who co-use may be exposed to higher levels of toxicants than those who only smoke tobacco (Meier & Hatsukami, 2016). People who use blunts initiate cannabis use earlier (Seaman, Green, et al., 2019) and smoke more frequently (Reboussin et al., 2021) compared with people who use cannabis in other ways. In addition, co-use of tobacco and cannabis is associated with increased dependence on both substances (Montgomery, 2015), reduced motivation to quit, and abstinence from product use (Lemyre et al., 2019; Schlienz & Lee, 2018). Given these health effects and use by individuals who suffer disproportionately from tobacco-related diseases and death (Simmons et al., 2016), it is critical to identify interventions to reduce co-use.

Limiting access to flavored cigar products may have an impact on co-use of cigars and cannabis, particularly use of blunts. Flavors enhance the perceived appeal while reducing the perceived harm of tobacco (Huang et al., 2017; Nyman et al., 2018; Sterling et al., 2016; Sterling et al., 2019). Flavors have been shown to facilitate initiation and progression of tobacco use and reduce intention to quit or likelihood of tobacco cessation (Huang et al., 2017; Villanti et al., 2019), potentially via increased abuse liability (Audrain-McGovern et al., 2023). Nearly half of people who smoke LCCs use flavored products (Rostron et al., 2020), which is more common among younger

adults, women, and those with less education (Glasser et al., 2017). Other correlates of flavored cigar use among YAs include smoking cigarillos (vs. large or little/filtered cigars), being Hispanic, Black, or Asian, current cannabis use, past or present use of blunts, and reporting using cigars because of affordability and availability in desired flavors (Hinds et al., 2018). Local flavor bans within the US have found reduced cigar sales following policy implementation (Diaz et al., 2024). The US Food and Drug Administration (FDA) has proposed a rule to ban flavors in cigar products nationally, and the impact this could have on co-use of cigars with cannabis is unexplored. Some qualitative research suggests that cigar flavor may be important for co-use with cannabis, particularly when smoking blunts (Antognoli et al., 2018; Giovenco et al., 2017; Kong et al., 2018), with one study reporting that 83% of adults who use blunts used a flavored cigar wrapper (Rosenberry et al., 2017). More research is needed to understand how flavor and other cigar characteristics impact patterns of co-use. In addition, it is critical to understand how YA's psychosocial context influences their co-use behaviors.

The present study is part of a larger mixed methods study; cross-sectional survey findings from this study revealed that while using a flavored cigarillo was not significantly associated with co-use or motivation to quit, living in an area with a flavored cigarillo ban was associated with a reduced likelihood of co-using with cannabis, controlling for living in a state where cannabis is legal to sell to adults (Glasser, Nemeth, et al., 2022; Glasser et al., 2023). In the present study, we sought to explain and provide context to findings from the quantitative survey and identify social-contextual factors that influence co-use behaviors using semi-structured telephone interviews with a geographically diverse sample of YAs in the US. Our research

questions included the following: (Primary) How does cigarillo flavor impact co-use of cigarillos and cannabis? (Secondary) What social-contextual factors are influential in patterns of co-use (and how does cigarillo flavor relate to these factors)?

Methods

Participant Recruitment and Screening

The study was approved by the Ohio State University Institutional Review Board (2021B0294). Participants were recruited in April to May of 2022 from a non-probability sample of participants in the Cigarillos Flavor and Abuse Liability, Attention, and Substitution (C-FLASH) Study, designed to evaluate perceptions of flavors on appeal, purchasing and risk perceptions of cigarillo products among YAs who use cigarillos. C-FLASH participants were YAs who smoke cigarillos (N=361) from 15 geographic areas (listed in Appendix 1) in the US with known high cigar use prevalence (Youth Risk Behavior Surveillance System; (Kann et al., 2018)). We recruited via email those who indicated a willingness to be contacted to participate in future studies. Individuals were eligible to participate in the study if they were: 1) between the ages of 21 and 28 years (minimum age reflects legal age to purchase tobacco); 2) smoked an average of at least 2 cigarillos per week over the past month; and 3) used cannabis at least once in the past month. Co-use in this study included using cigarillos and cannabis concurrently but separately or together in a blunt.

Eligibility was determined using a brief, web-based screening survey linked in the email. Eligible participants were sent the consent form by email before the interview, and study staff reviewed the form with individuals at the time of the interview. Time was given before the interview for questions and to review all aspects of participating in

the study. All individuals were asked to consent verbally before participating in the research study. A waiver of consent documentation was obtained due to the remote nature of the interview. Out of 378 participants emailed, 125 (33%) filled out the eligibility screener, 92 (74%) of responders were eligible, and 38 (41%) of those eligible completed the interviews (52 of those eligible were unavailable and two interviews were incomplete), which was sufficient to reach thematic saturation. These participants received a \$30 gift card delivered via email.

Study Procedures

Study personnel (AG) conducted phone interviews to understand participants' experiences smoking cigarillos and cannabis. Interviews were 30 minutes to one hour in length and were semi-structured to allow for flexible conversation. We used an interview guide to follow during interviews, informed by the Social-Contextual Model of Health Behavior (SCM) (Figure 1) (Sorensen et al., 2003). The SCM considers the social context in which health behaviors occur and has been applied to explain behaviors and develop interventions, including to decrease tobacco use (Sorensen et al., 2003; Sorensen et al., 2009; Sorensen et al., 2010). The interview guide contained questions relevant to Phase I of the study (relationship between cigarillo flavor and co-use, highlighted in grey), and questions related to other factors theorized to influence cigarillo use and co-use with cannabis at multiple levels of the social ecology ("modifying conditions") (Agrawal et al., 2012; Seaman, Green, et al., 2019). We also assessed self-identified sociodemographic characteristics (gender identity, age, race/ethnicity, income, education, sexual orientation).

Data Analysis

Recordings and transcripts were deidentified for analysis. Interviews were professionally transcribed by a paid service, and transcripts were reviewed and compared to the recordings to ensure accuracy. Transcriptions were analyzed in ATLAS.ti software, which facilitated systematic coding and analytic comparisons. We employed an iterative approach to codebook development and coding, endorsed by the CDC, to analyze interview data (MacQueen et al., 1998). First, we coded text according to the specific research question from the interview guide using structural codes (deductive coding approach). Second, we created in-depth codes using emergent themes from the structurally coded text (inductive coding approach). We allowed the study's theoretical framework (Figure 1) to guide the analysis; in addition, we looked for arising patterns that may be tangential to or diverge from theory (Braun & Clarke, 2014). Results from deductive coding are presented by research question, and results by inductive coding are presented in tables. To verify the findings, two trained study personnel (AG, EB) separately coded data in all interviews and compared for discrepancies; a consensus meeting with the study investigators resolved differences. Inter-coder agreement was satisfactory (Krippendorff's $\alpha = 0.789$). Illustrative quotations were selected to highlight major themes. Themes were examined by sociodemographic characteristics.

Results

Demographic and Use Characteristics

The sample was majority older YAs (61% ages 25-28 years vs. 39% ages 21-24 years), half female, 47% Black, 47% with an individual income of \$25,000 to \$49,999,

45% with some college education, and about one-third sexual or gender minority (self-identified as gender non-binary, gay, lesbian, bisexual, pansexual, or not sure about sexual orientation) (Table 1).

Most participants co-administered cigarillos and cannabis through blunts (89%), while others typically smoked them separately on the same (21%) or different occasion (39%) (patterns were not mutually exclusive).

Research Question 1 (Primary): How Flavors Impact Co-Use of Cigarillos and Cannabis Among YAs

Cigarillo flavor played a large role in the use of cannabis for this study's participants, whether this was positive or negative. However, a potential ban on flavored cigarillos did not deter participants from continuing to use cannabis. Other cigarillo product features arose as salient for smoking blunts. Key themes are presented in Table 2.

Theme 1.1. Cigarillo Flavor Positively Impacts Cannabis Use

The most frequently mentioned reason that cigarillos are appealing was the flavors (47%), and most participants in this study believed that flavored cigarillos enhanced the experience of smoking cannabis (45%); this perception was more commonly discussed by participants identifying as female and as Black, Hispanic, or multiracial than among White participants. One participant felt that flavor makes cannabis more enticing:

Oh yeah. I use cannabis more. So, it impacts it very much because it's just, it's more enticing to smoke it when it has flavor. And then especially added on to the flavor. You have the cannabis, the flavor of that. So, it makes it way more enticing. (Hispanic female, 25-28 years).

Those who prefer flavored cigarillos for cannabis use referred to liking fruity, sweet or mint flavors, like this participant:

Participant: “Yeah, I usually use the like, Black and Mild Jazz if I'm just smoking the tobacco ones. And then if I get like blunts, I'll get flavored ones as well.”

Interviewer: “And what flavors do you use for that?”
Participant: “Usually like grape or mango or just like fruity flavors, sweeter flavors.” (White male, 25-28 years)

Flavors that cover up the smell of the cannabis were also preferred: “I think in terms of flavor, considering flavor can help maybe cover the smell of marijuana. [...] So, flavor plays a bigger part in terms of [...] covering the smell of cannabis.” (Black male, 25-28 years).

Theme 1.2. Cigarillo Flavor Negatively Impacts Cannabis Use

About one-fifth of the study participants (21%) felt that flavors can negatively impact cannabis use, a belief more commonly held by male participants. Several described how cigarillo flavor interferes with the cannabis:

Participant: “Because some flavors mess with the cannabis, so, no.”
Interviewer: “Okay. And does it taste bad when you use it together?”
Participant: “Yes. It takes away from the actual taste of the cannabis.” (Black male, 21-24 years)

Nearly half of the participants (42%) expressed concern that flavors added harm to cigarillos, most of whom attributed this to flavor ingredients or increased addictive properties. One Black female, 25-28 years of

age, noted, “The flavored ones are worse because you don't know what type of chemical they're putting in there to make it flavored.” Only a couple participants mentioned the impact of perceived cigarillo flavor harm/addictiveness on their cannabis use. This individual (White male, 21-24 years) thought that cigarillo flavor may facilitate dependence on cannabis:

Interviewer: “And what impact does the flavor have on your cannabis use?”
Participant: “Mm, it makes me to be addicted to it. So, I think that's the only part, the addiction, cause I'm used to, to using those flavored ones.”

Theme 1.3. Cigarillo Flavor Does Not Impact Cannabis Use

About one-third of study participants did not believe cigarillo flavor made any impact on cannabis use at all. Even among those who held the predominant opinion that cigarillo flavor positively impacts cannabis use, participants mostly felt that a cigar flavor ban would not impact their cannabis use. Participants stated that they would either continue using unflavored cigarillos to roll blunts or would migrate to another method of smoking or consuming cannabis:

I could still use it. I think the main reason of people really use cigarillos or cigarillo blunts is the flavor in that the flavor covers up for the smell of cannabis. But I think also the smell of tobacco covers that in some sense that when you smoke near people, someone will tend to smell tobacco first before smelling cannabis. So, I think flavor plays a bigger part, maybe covering up that, but also the tobacco smell plays a part. [...] if flavor wasn't available, I think I'll still use cigarillos. (Black male, 21-24 years)

Theme 1.4. There Are Other Important Cigarillo Characteristics Impacting Cannabis Use

Several other cigarillo product characteristics emerged as important for co-use with cannabis, primarily for using blunts. The top characteristic mentioned was slow burn time: “I honestly, I just like the slow burn time. I find that they burn a lot slower than papers. And so that extends the length, the life of the cannabis.” (Multiracial male, 25-28 years). Low cost and/or price promotions, ease to break down and roll, and convenience both to obtain and to transport based on size and discreetness were other frequently discussed desired product features, as illustrated by this White male, 25-28 years: “Probably, it's like more discreet kind of. Then you don't have to like tow around a bulky pipe or anything like that.”

The additive high/nicotine boost from cigarillos was frequently mentioned. One participant illustrates the combined effect of cigarillos and cannabis:

So, for me at most times I try to smoke with cannabis because, it's my personal opinion, but I kind of get high faster when I use, put tobacco and cannabis together. So, that's why I prefer using them at the same time. (Black male, 21-24-years).

Several participants also discussed cigarillos' smooth pull and throat hit. This participant described this trait as being unique to cigarillos compared with rolling papers:

It's the way that they pull when you smoke weed. Like I said, when you use papers and different things that are too light, it's more of a, it's a lot of more weed smoke, which can clog your lungs. It's a bad inhale. So, when the cigarillos are thicker, so it's a smoother inhale to the

back of your throat. Like, when I smoke papers and stuff, that makes me cough, cigarillos don't make me cough. (Black female, 21-24 years)

Research Question 2 (Secondary): Influential Social-Contextual Factors in Co-use of Cigarillos and Cannabis Among YAs

Factors at the individual, interpersonal, and community/policy levels impact cigarillo and cannabis co-use for participants in this study, including management of mental and physical health, perceived harm/addictiveness of each product, use among friends and family, exposure to advertising, and community social norms. Cigarillo flavor arose in the context of ease of access in the community, in limited time cigar promotions, and in the impact of local cigar flavor bans. In-depth findings are described in Appendix 2, and a summary of key themes and example quotes are presented in Table 3.

Discussion

Using semi-structured, qualitative interviews with YAs co-using cannabis and cigarillos in the past month, this study illuminated the role of cigarillo flavor and social-contextual influences on co-use behaviors. These YAs perceived cigarillos as appealing because of the variety of flavors available, but they also believed that flavors may make cigarillos more harmful and addictive. While flavors were preferred for smoking cigarillos with cannabis (particularly when smoking blunts), participants did not anticipate quitting smoking cannabis if they faced a ban on flavored cigars. Other product characteristics emerged as being crucial to the experience of creating and smoking blunts, such as slow burn time and transportability. Factors at multiple levels of the social ecology also emerged as important influences on co-use.

Figure 1. Adapted Social-Contextual Model of Health Behavior to explain co-use of cigarillos and cannabis among YAs.

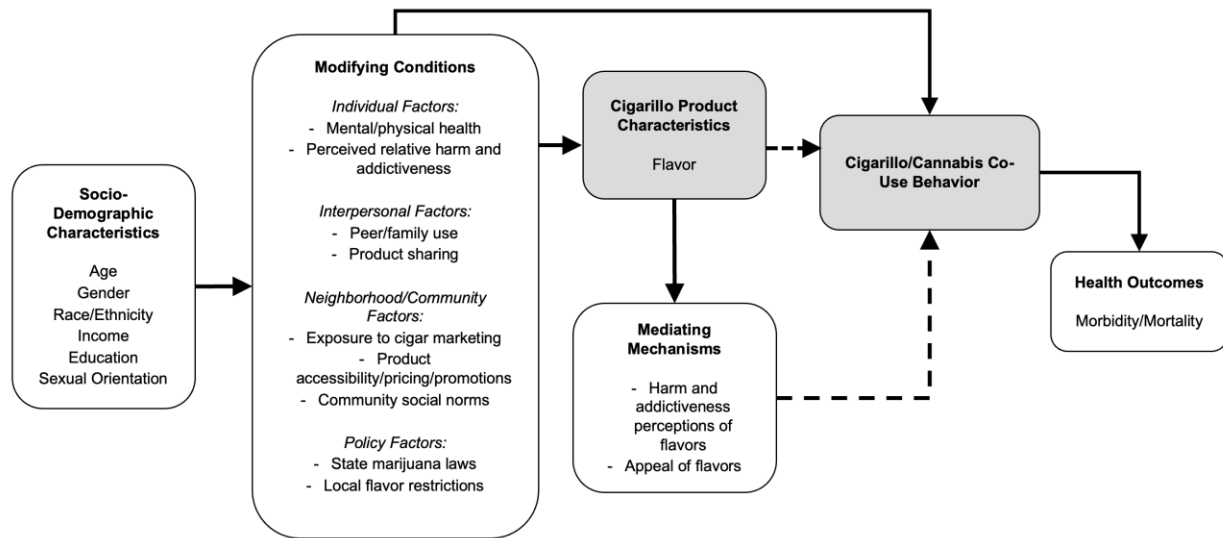


Figure 1. Adapted Social-Contextual Model of Health Behavior to explain co-use of cigarillos and cannabis among YAs. Socio-demographic characteristics shape the modifying conditions in which young adults co-use cigarillos and cannabis and that may moderate the relationship between product characteristics and co-use behavior. Flavored cigarillos are hypothesized to impact co-use by impacting perceptions of harm and appeal.

Table 1. Characteristics of YAs who used cigarillos and cannabis in past 30-days (N=38)

Participant Characteristic	n (%)
Age	
21-24	15 (39)
25-28	23 (61)
Gender Identity	
Female	19 (50)
Male	18 (47)
Non-Binary	1 (3)
Race/Ethnicity	
Black	18 (47)
White	15 (39)
Hispanic	2 (5)
Multiracial	3 (8)
Annual Income	
<\$25,000	10 (26)
\$25,000-\$49,999	18 (47)
\$50,000-\$74,999	9 (24)
\$75,000+	1 (3)
Highest Education	
High School or less	8 (21)
Some College	17 (45)
Bachelor's Degree +	13 (34)
Sexual Orientation	
Straight/Heterosexual	24 (63)
Gay/Lesbian	4 (11)
Bisexual	8 (21)
Pansexual	1 (3)
Not Sure	1 (3)

Table 2. Findings from Key Question 1: How does cigarillo flavor impact co-use of cigarillos and cannabis?

Themes	Subthemes
1.1. Cigarillo flavor positively impacts cannabis use	• Cigarillo flavor enhances the experience of smoking cannabis • Fruity/sweet cigarillo flavors are preferred for smoking cannabis • Cigarillo flavors cover up the smell of cannabis
1.2. Cigarillo flavor negatively impacts cannabis use	• Cigarillo flavor interferes with the cannabis flavor • Cigarillo flavor may actually be making use more harmful
1.3. Cigarillo flavor does not impact cannabis use	• If cigarillo flavors were banned, cannabis use would not be impacted
1.4. There are other important cigarillo characteristics impacting cannabis use	• Slow burn time is a key cigarillo characteristic beneficial for smoking cannabis • Combined effect of tobacco and cannabis and smooth pull/throat hit are positive sensory experiences associated with cigarillos used for smoking cannabis • Cigarillos' convenience (low price, ease of breaking down, and discreetness) makes them desirable for smoking cannabis

Table 3. Findings from Key Question 2: What social-contextual factors are influential in patterns of co-use (and how does cigarillo flavor relate to these factors)?

Themes	Subthemes	Example Quote(s)
2.1. Cannabis and cigarillos are co-used to manage mental and physical health (<i>individual-level factor</i>)	• Cannabis and cigarillos (with or without cannabis) are used to alleviate mental or physical health symptoms • Cannabis and/or cigarillos are used as an escape from daily realities • Cannabis and/or cigarillos are used to de-escalate in moments of high stress	“At first? I was just trying to see if I would like it or not. Now it just, they are stress relievers whenever I'm having stress. Instead of me spazzing or freaking out and yelling and taking my anger or frustration out other people, I can just sit back or sit down and just smoke and I can just be like, okay. It calms me.” (Black female, 25-28 years)
2.2. Perceived relative harm and addictiveness of cigarillos (with tobacco) and cannabis impacts use (<i>individual-level factor</i>)	• Removing tobacco from cigarillos and replacing with cannabis (in a blunt) reduces the harm • Cigarillos with tobacco are more addictive than cannabis, and their addictive properties stem from different sources	“I definitely think that they're, I dunno how harmful, I think they're harmful. I think that they're less harmful because I do usually dump the insides out and I'm only using the outside, but I know it's still not good for me either way.” (Multiracial female, 25-28 years)
2.3. Cannabis is more impacted by social influences than tobacco (<i>interpersonal-level factor</i>)	• Blunts are shareable and used in social situations • With no peer influence, motivation to stop using cannabis would be stronger than for cigarillos with tobacco	“Yeah, I mean, I'll share, like smoking a blunt, like I'll, you know, share that, but I usually don't smoke or share just the cigarillos.” (White male, 25-28 years)
2.4. Cigarillos are easily accessible, promoted, and socially acceptable (<i>community-level factor</i>)	• Cigarillos are available for purchase in the community for inexpensive prices and in a wide range of flavors • Accessibility of cigarillos makes them ideal for use creating blunts • If cigarillos became too expensive, participants would switch to other modes of cannabis administration	“Increasingly, because when I see limited time, I'm like, okay. So, I dunno how long it's been sitting up here since I've just seen it now. So, I better go ahead and grab it. And then I find myself buying either five to six to a carton.” (Black male, 21-24 years) “I know Speedway, I normally see it like the beginning of the month. There's like a new, like maybe either sale or a new flavor. [...] I know White Owl is

	• Cigarillo users are influenced by price promotions or limited time offers, most often for a seasonal flavor • Due to the ubiquity of cigarillos and cannabis in the community, they are socially acceptable	known always for introducing flavors.” (Black male, 21-24 years)
2.5. Cannabis and cigar policies may impact usage (<i>policy-level factor</i>)	• Cannabis prohibition is perceived to make cannabis use dangerous • Cigar policies do not substantially affect usage, but make obtaining products more difficult and using different flavors (e.g., “blue,” “green”)	“Kind of outta habit really out of, not necessity, but kind of to make it less risky when I’m out and about. It’s just kinda like, I feel like if it was just completely legal and I could, you know what I mean, smoke bong loads on the side of the road. I feel like I wouldn’t really have a need for cigarillos, but, because there is that risk. (White female, 21-24 years)

Nearly 90% of participants in this study co-administered cannabis and cigarillos in blunts as their primary co-use pattern, as opposed to using cannabis and cigarillos on separate occasions. People who use blunts initiate cannabis use earlier (Seaman, Green, et al., 2019), smoke more frequently (Jensen et al., 2024; Reboussin et al., 2021), and develop greater dependence or problem use (Timberlake, 2009) than people who use cannabis in other ways. Despite this, only one study has assessed the impact of cannabis policy on use of blunts, finding that legalized cannabis is associated with higher odds of blunt use among adolescents, but only in states with no smoke-free tobacco policy (Orsini et al., 2024). Therefore, further research is needed to characterize blunt users and understand how policies and other interventions impact blunt use.

While most participants smoking blunts believed cigarillo flavor enhances the experience, many felt that flavors interfered with the experience or made no impact at all. Other qualitative studies of YAs found a predominance of flavored cigar use for blunts (Antognoli et al., 2018; Giovenco et al., 2017; Kong et al., 2018; Seaman, Howard, et al., 2019), but one study included some participants who described preferring unflavored cigarillos for blunts (Giovenco et al., 2017). Additionally, one quantitative survey of adults found that 83% of those who ever used a blunt used a flavored cigar wrapper (Rosenberry et al., 2017), but “ever use” may indicate trial and not reflect typical products used. Another study found that participants enjoyed the taste or smell when creating blunts, but that after beginning to smoke, they no longer taste the specific flavor of the cigarillo (Kong et al., 2018), suggesting that perhaps flavor is only enjoyed briefly and thus its role is of low importance.

Participants mostly predicted that a flavored cigar ban would not impact their cannabis use, stating that they would either continue using unflavored cigarillos to roll blunts or would switch to another method of administering cannabis, consistent with another recent qualitative study exploring behavior change following a hypothetical flavored cigar ban among adults identifying as Black who smoke cigars and typically smoke them as blunts (Pakdaman et al., 2022). In the quantitative survey phase of our project, we found that YAs were less likely to co-use cigarillos with cannabis if they lived in an area where cigar flavors were banned; however, when limited to only those who reported usually smoking blunts (as opposed to any co-users), there was no relationship (Glasser et al., 2023).

These findings taken together suggest that although cigarillo flavor appeal may promote cannabis use, ultimately there are other product features that trump flavor and/or the motivation to continue using cannabis goes beyond mode of administration, reflected in the lower motivation to quit cannabis among co-users in the quantitative phase of our study (Glasser, Nemeth, et al., 2022). Other product characteristics important to YAs in this study included burn time, ease of breaking down and rolling, transportability/discreetness, smooth pull and throat hit, and nicotine boost, consistent with some other qualitative research (Kong et al., 2018; Schauer et al., 2016). In the face of a flavor ban, switching to other forms of cannabis could reduce harm because blunts have been found to be used more frequently and intensely than other modes of administration (Schauer et al., 2017; Shrier et al., 2013). Continued monitoring of trends is needed, especially in the context of expanding cannabis legalization and emerging cannabis product types, including blunt wraps and pre-rolls (Kong et al., 2024; Paredes et al., 2024; Rhee

et al., 2024). At the time of our study, 19 states and the District of Columbia had passed legislation to sell cannabis to adults, and since then, five more states have legalized recreational cannabis (National Conference of State Legislatures, 2024), underscoring the need to assess the cannabis retail landscape and its impact on use patterns and health outcomes.

Other social-contextual factors emerged from the data, including co-use to manage mental and physical health, perceived lower harm of cannabis compared with tobacco (and thus reducing harm of cigarillos when creating blunts), peer use, easy access to flavored cigarillos and price promotions, community norms, and policies. The most frequently discussed motivation to co-use was smoking to alleviate mental health symptoms. Other qualitative studies have found similar motivations to smoke cigars and cannabis (Broun et al., 2022; Seaman, Howard, et al., 2019), and national data show increased odds of blunt use among young adults with moderate-high internalizing and externalizing problems (Mattingly et al., 2023). Cannabis was described by mostly females and those identifying as lesbian, gay, bisexual, or pansexual as being beneficial to manage mental health. A study found female youth (not males) were more likely to use cannabis if they believed it would help to regulate negative mood (Crane et al., 2021). We also found the females and racial/ethnic minoritized participants more commonly said they would continue smoking even if the price of cigarillos increased or none of their peers smoked, consistent with evidence that these groups are less likely to quit (Agrawal et al., 2008; Smith et al., 2016; Trinidad et al., 2011).

Another major factor discussed by participants in this study was the easy access to cigarillos. Gas stations and convenience stores carrying abundant cigarillos in a large variety of flavors were typically just around

the corner from where these YAs lived, a neighborhood factor reported by co-users in other studies (Broun et al., 2022; Kong et al., 2018). Cigarillos are sold in cheap one- or two-packs, making purchases even more convenient (Antognoli et al., 2018; Giovenco et al., 2017; Kong et al., 2018). In the retail environment, YAs are exposed to advertisements for new products, flavors, and deals (Broun et al., 2022), which participants in our study noted encouraged purchase of products.

Limitations

There are several limitations to this study. It is possible that participants from the C-FASH study who agreed to be contacted in the future may be different in relevant ways from those who did not agree to be contacted, which could introduce selection bias. We relied on a somewhat small non-probability sample, so will have limited generalizability to other settings and populations. With qualitative interview studies, there is a risk of social desirability bias; however, the interviews took place over the phone protecting anonymity. Descriptions of behavior change in the face of policy intervention by participants are largely hypothetical and may not reflect actual behavior.

Conclusions

Although many YAs who co-used cigarillos and cannabis in this study did not anticipate quitting cannabis use if cigar flavors were banned, none expected to increase cannabis use, suggesting a neutral to positive impact of this regulatory approach. To reduce co-use, policymakers should consider additional approaches, such as reducing retail accessibility of cigarillos or interventions to address psychosocial and structural determinants of use.

Implications for Health Behavior Research

There are several important implications uncovered from this study's findings. First, a product standard to ban flavors in cigar products at the national level in the US may result in a neutral to positive impact on co-use of cigarillos and cannabis among YAs. Findings from the quantitative phase of this study showed that while cigarillo flavor bans were associated with a lower likelihood of co-using cigarillos with cannabis (Glasser et al., 2023), there was no association between using flavored cigarillos and co-use or motivation to quit using these products (Glasser, Nemeth, et al., 2022). Further, findings from the present study showed that many co-users did not anticipate quitting cannabis use if cigarillo flavors were banned; however, none described increasing cannabis use. Although removal of flavored cigarillos from the market may not deter YAs from continuing to smoke cannabis, the growing evidence that local flavor restrictions can reduce tobacco use in other populations not limited to co-users (Rogers et al., 2022) supports the US FDA to take action to ban flavors in cigar products. Coupled with evidence from a national study on hypothetical behavior change in the event of a ban suggesting 15.1% of adults who smoke cigars would quit, 29.2% would switch to cannabis, 41.6% would switch to unflavored cigars, and 33.4% would switch to other flavored tobacco products (Chen-Sankey et al., 2022), our findings indicate that policymakers and researchers will need to anticipate these countervailing effects and monitor them as regulation is put in place.

Second, policies to minimize ease of access to cigarillos are needed. Potential approaches include establishing a minimum pack size (Ganz et al., 2022; Mays et al., 2022), increasing taxes or price floors,

removing access to price promotions (e.g., ability to redeem coupons) (Ribisl et al., 2022), or licensing/ordinances to reduce tobacco retailer density (Craigmile et al., 2021; Glasser, Onnen, et al., 2022). Better yet, a combination of approaches can help prevent tobacco companies from offsetting the impact of one pricing approach alone (Ribisl et al., 2022).

Third, structural interventions that address the social determinants of health for young adults, particularly in more marginalized groups, are needed to ameliorate conditions that lead to socioeconomic stressors described by young adults in this study (Brown et al., 2019). These could be agnostic to health behavior but that prevent risk factors from developing in the first place, such as economic instability or poor mental health, and instead promote protective factors, like academic achievement and family support. These types of interventions (e.g., focusing on economic or education policy) not only can prevent health behaviors like smoking, but can reduce health inequities by disproportionately benefitting vulnerable populations (Brown et al., 2019).

Fourth, numerous other interventions should be considered to address other influential factors in young adults' lives promoting co-use of cigarillos and cannabis. Expanding evidence-based tobacco smoking cessation to integrate concurrent cessation of combustible cannabis may also be necessary, as evidence suggests combustible tobacco cessation is less likely among cannabis smokers (Rogers et al., 2020), and co-users who use tobacco routes of cannabis administration are less motivated to reduce tobacco use than those who use non-tobacco routes of administration (Hindocha et al., 2016). Evidence-based cessation support should also be made more accessible to more socioeconomically disadvantaged populations (Villanti et al., 2022) such as: providing free nicotine replacement therapy

at culturally competent community organizations, (Shelley et al., 2010) improving communication strategies and patient navigation to the tobacco quitline in healthcare settings (Matthews et al., 2021), or providing access to free quitting programs (Graham et al., 2016). In addition, information campaigns at the community level and/or through social media may be necessary to counteract positive smoking norms and encourage cessation (Broun et al., 2022). Given the positive relationship between perceived harm of cigarillos and motivation to quit cigarillos in this study, efforts to inform the public on the harms of cigarillos are needed, including communication campaigns and, in the US, reinstating required warning labels on cigar products (U.S. Food & Drug Administration, 2021).

Discussion Questions

Our findings indicate that cigar flavor bans may not deter young adults from using blunts (cigars with tobacco mixed or replaced with cannabis) and that there are multi-level factors influencing their use, including managing mental health and widespread access to cigars/cannabis. What types of upstream, or structural interventions, do you think could reduce young adults' motivation to use blunts (and perhaps more broadly prevent substance use)?

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Ethical Approval Statement

The study was approved by the Ohio State University Institutional Review Board (2021B0294).

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

References

- Agrawal, A., Budney, A. J., & Lynskey, M. T. (2012). The co-occurring use and misuse of cannabis and tobacco: a review. *Addiction*, 107(7), 1221-1233. <https://doi.org/10.1111/j.1360-0443.2012.03837.x>
- Agrawal, A., Sartor, C., Pergadia, M. L., Huizink, A. C., & Lynskey, M. T. (2008). Correlates of smoking cessation in a nationally representative sample of U.S. adults. *Addict Behav*, 33(9), 1223-1226. <https://doi.org/10.1016/j.addbeh.2008.04.003>
- Antognoli, E., Koopman Gonzalez, S., Trapl, E., Cavallo, D., Lim, R., Lavanty, B., & Flocke, S. (2018). The social context of adolescent co-use of cigarillos and marijuana blunts. *Subst Use Misuse*, 53(4), 654-661. <https://doi.org/10.1080/10826084.2017.1355388>
- Audrain-McGovern, J., Manikandan, D., Koita, F., Klapac, O., Pickworth, W. B., & Stone, M. D. (2023). Effect of sweet flavouring on the rewarding and reinforcing value of cigarillo use among young adults. *Tob Control*. <https://doi.org/10.1136/tc-2023-058307>

- Braun, V., & Clarke, V. (2014). What can "thematic analysis" offer health and wellbeing researchers? *Int J Qual Stud Health Well-being*, 9, 26152. <https://doi.org/10.3402/qhw.v9.26152>
- Broun, A., Phan, L., Duarte, D. A., Ajith, A., Jewett, B., Mead-Morse, E. L., Choi, K., & Chen-Sankey, J. (2022). Physical and sociocultural community-level influences on cigar smoking among Black young adults: An in-depth interview investigation. *Int J Environ Res Public Health*, 19(8). <https://doi.org/10.3390/ijerph19084430>
- Brown, A. F., Ma, G. X., Miranda, J., Eng, E., Castille, D., Brockie, T., Jones, P., Airhihenbuwa, C. O., Farhat, T., Zhu, L., & Trinh-Shevrin, C. (2019). Structural interventions to reduce and eliminate health disparities. *Am J Public Health*, 109(S1), S72-S78. <https://doi.org/10.2105/AJPH.2018.304844>
- Chen-Sankey, J., Elhabashy, M., Ajith, A., Jewett, B., Hacker, K., Phan, L., & Choi, K. (2022). Correlates of behavior change intents in response to a hypothetical flavored cigar sales restriction among U.S. adult flavored cigar smokers. *Prev Med*, 107128. <https://doi.org/10.1016/j.ypmed.2022.107128>
- Cohn, A. M., & Chen, S. (2022). Age groups differences in the prevalence and popularity of individual tobacco product use in young adult and adult marijuana and tobacco co-users and tobacco-only users: Findings from Wave 4 of the population assessment of tobacco and health study. *Drug Alcohol Depend*, 233, 109278. <https://doi.org/10.1016/j.drugalcdep.2022.109278>
- Corey, C. G., Dube, S. R., Ambrose, B. K., King, B. A., Apelberg, B. J., & Husten, C. G. (2014). Cigar smoking among U.S. students: Reported use after adding brands to survey items. *Am J Prev Med*, 47(2 Suppl 1), S28-35. <https://doi.org/10.1016/j.amepre.2014.05.004>
- Cornelius, M. E., Loretan, C. G., Jamal, A., Davis Lynn, B. C., Mayer, M., Alcantara, I. C., & Neff, L. (2023). Tobacco product use among adults - United States, 2021. *MMWR Morb Mortal Wkly Rep*, 72(18), 475-483. <https://doi.org/10.15585/mmwr.mm7218a1>
- Craigmile, P. F., Onnen, N., Schwartz, E., Glasser, A., & Roberts, M. E. (2021). Evaluating how licensing-law strategies will impact disparities in tobacco retailer density: a simulation in Ohio. *Tob Control*, 30(e2), e96-e103. <https://doi.org/10.1136/tobaccocontrol-2020-055622>
- Crane, N. A., Langenecker, S. A., & Mermelstein, R. J. (2021). Risk factors for alcohol, marijuana, and cigarette polysubstance use during adolescence and young adulthood: A 7-year longitudinal study of youth at high risk for smoking escalation. *Addict Behav*, 119, 106944. <https://doi.org/10.1016/j.addbeh.2021.106944>
- Diaz, M. C., Yoon, S. N., Donovan, E., Akbar, M., & Schillo, B. A. (2024). The effect of state and local flavored cigar sales restrictions, on retail sales of large cigars, cigarillos, and little cigars in Massachusetts, California, Illinois, and New York. *Nicotine Tob Res*, 26(2), 169-176. <https://doi.org/10.1093/ntr/ntad121>
- Ganz, O., Jeong, M., Schroth, K. R. J., & Hrywna, M. (2022). The importance of cigarillo product characteristics among young adult cigarillo users: Differences by demographics, cigarillo use and other tobacco/substance use behaviors. *PLoS One*, 17(4), e0265470.

- <https://doi.org/10.1371/journal.pone.0265470>
- Giovenco, D. P., Miller Lo, E. J., Lewis, M. J., & Delnevo, C. D. (2017). "They're Pretty Much Made for Blunts": Product features that facilitate marijuana use among young adult cigarillo users in the United States. *Nicotine Tob Res*, 19(11), 1359-1364.
- <https://doi.org/10.1093/ntr/ntw182>
- Glasser, A. M., Johnson, A. L., Rose, S. W., Ganz, O., Cantrell, J., Delnevo, C. D., & Villanti, A. C. (2017). Correlates of cigar use by type and flavor among US young adults: 2011-2015. *Tobacco Regulatory Science*, 3(Supplement 1), 59-71.
- Glasser, A. M., Nemeth, J. M., Quisenberry, A. J., Shoben, A. B., Trapl, E. S., & Klein, E. G. (2022). Cigarillo flavor and motivation to quit among co-users of cigarillos and cannabis: A structural equation modeling approach. *Int J Environ Res Public Health*, 19(9). <https://doi.org/10.3390/ijerph19095727>
- Glasser, A. M., Nemeth, J. M., Quisenberry, A. J., Shoben, A. B., Trapl, E. S., & Klein, E. G. (2023). The role of cigarillo flavor in the co-use of cigarillos and cannabis among young adults. *Subst Use Misuse*, 58(5), 717-727. <https://doi.org/10.1080/10826084.2023.2184206>
- Glasser, A. M., Onnen, N., Craigmile, P. F., Schwartz, E., & Roberts, M. E. (2022). Associations between disparities in tobacco retailer density and disparities in tobacco use. *Prev Med*, 154, 106910. <https://doi.org/10.1016/j.ypmed.2021.106910>
- Graham, A. L., Carpenter, K. M., Cha, S., Cole, S., Jacobs, M. A., Raskob, M., & Cole-Lewis, H. (2016). Systematic review and meta-analysis of Internet interventions for smoking cessation among adults. *Subst Abuse Rehabil*, 7, 55-69. <https://doi.org/10.2147/SAR.S101660>
- Hindocha, C., Freeman, T. P., Ferris, J. A., Lynskey, M. T., & Winstock, A. R. (2016). No smoke without tobacco: A global overview of cannabis and tobacco routes of administration and their association with intention to quit. *Front Psychiatry*, 7, 104. <https://doi.org/10.3389/fpsy.2016.00104>
- Hinds, J. T., 3rd, Li, X., Loukas, A., Pasch, K. E., & Perry, C. L. (2018). Flavored cigars appeal to younger, female, and racial/ethnic minority college students. *Nicotine Tob Res*, 20(3), 347-354. <https://doi.org/10.1093/ntr/ntx041>
- Huang, L. L., Baker, H. M., Meernik, C., Ranney, L. M., Richardson, A., & Goldstein, A. O. (2017). Impact of non-menthol flavours in tobacco products on perceptions and use among youth, young adults and adults: a systematic review. *Tob Control*, 26(6), 709-719. <https://doi.org/10.1136/tobaccocontrol-2016-053196>
- Jensen, J. K., Ganz, O., Tomaino, M., Glasser, A. M., Sterling, K., Delnevo, C. D., & Manderski, M. T. B. (2024). Patterns of blunt and cigar use in the United States, 2015-2019. *medRxiv*. <https://doi.org/10.1101/2024.02.26.24303391>
- Kann, L., McManus, T., Harris, W. A., Shanklin, S. L., Flint, K. H., Queen, B., Lowry, R., Chyen, D., Whittle, L., Thornton, J., Lim, C., Bradford, D., Yamakawa, Y., Leon, M., Brener, N., & Ethier, K. A. (2018). Youth risk behavior surveillance - United States, 2017. *MMWR Surveill Summ*, 67(8), 1-114. <https://doi.org/10.15585/mmwr.ss6708a1>
- Kong, G., Cavallo, D. A., Goldberg, A., LaVallee, H., & Krishnan-Sarin, S. (2018). Blunt use among adolescents and young adults: Informing cigar regulations. *Tob Regul Sci*, 4(5), 50-60. <https://doi.org/10.18001/TRS.4.5.5>

- Kong, G., Morean, M. E., Davis, D. R., Bold, K. W., & Krishnan-Sarin, S. (2024). Tobacco-free blunt wraps: A regulatory conundrum. *Tob Control*, 33(e1), e136-e137. <https://doi.org/10.1136/tc-2023-058100>
- Lemyre, A., Poliakova, N., & Belanger, R. E. (2019). The relationship between tobacco and cannabis use: A review. *Subst Use Misuse*, 54(1), 130-145. <https://doi.org/10.1080/10826084.2018.1512623>
- MacQueen, K. M., McLellan, E., & Milstein, B. (1998). Codebook development for team-based qualitative analysis. *CAM Journal*, 10(2), 31-36.
- Matthews, A. K., Watson, K. S., Duang, C., Steffen, A., & Winn, R. (2021). A study protocol for increasing access to smoking cessation treatments for low-income minority smokers. *Front Public Health*, 9, 762784. <https://doi.org/10.3389/fpubh.2021.762784>
- Mattingly, D. T., Mezuk, B., Elliott, M. R., Neighbors, H. W., & Fleischer, N. L. (2023). Racial and ethnic disparities in mental health problems and tobacco and cannabis use among US emerging adults. *J Racial Ethn Health Disparities*. <https://doi.org/10.1007/s40615-023-01822-z>
- Mauro, P. M., Carliner, H., Brown, Q. L., Hasin, D. S., Shmulewitz, D., Rahim-Juwel, R., Sarvet, A. L., Wall, M. M., & Martins, S. S. (2018). Age differences in daily and nondaily cannabis use in the United States, 2002-2014. *J Stud Alcohol Drugs*, 79(3), 423-431. <https://doi.org/10.15288/jsad.2018.79.423>
- Mays, D., Johnson, A. C., Jeong, M., Ganz, O., Audrain-McGovern, J., Strasser, A. A., & Delnevo, C. D. (2022). Tobacco minimum packaging policy to reduce cigarillo use among young people: results of an experimental study. *Tob Control*. <https://doi.org/10.1136/tc-2022-057304>
- Meier, E., & Hatsukami, D. K. (2016). A review of the additive health risk of cannabis and tobacco co-use. *Drug Alcohol Depend*, 166, 6-12. <https://doi.org/10.1016/j.drugalcdep.2016.07.013>
- Montgomery, L. (2015). Marijuana and tobacco use and co-use among African Americans: results from the 2013, National Survey on Drug Use and Health. *Addict Behav*, 51, 18-23. <https://doi.org/10.1016/j.addbeh.2015.06.046>
- National Conference of State Legislatures. (2024). *Cannabis Overview*. Retrieved April 4 from <https://www.ncsl.org/civil-and-criminal-justice/cannabis-overview>
- Nyman, A. L., Sterling, K. L., Majeed, B. A., Jones, D. M., & Eriksen, M. P. (2018). Flavors and risk: Perceptions of flavors in little cigars and cigarillos among U.S. adults, 2015. *Nicotine Tob Res*, 20(9), 1055-1061. <https://doi.org/10.1093/ntr/ntx153>
- Orsini, M. M., Vuolo, M., & Kelly, B. C. (2024). Cannabis liberalization is only associated with increased blunt use if states lack strong tobacco control. *Addictive Behaviors*. <https://doi.org/10.1016/j.addbeh.2024.108100>
- Pakdaman, S., Broun, A., Duarte, D. A., Ajith, A., Jewett, B., Wong, N., Mead-Morse, E. L., Choi, K., & Chen-Sankey, J. (2022). Exploring the hypothetical impact of flavored cigar sales restrictions among black young adult cigar smokers: a semi-structured in-depth interview investigation. *J Ethn Subst Abuse*, 1-19. <https://doi.org/10.1080/15332640.2022.2109089>
- Paredes, J., D'Anna, L., Ramirez, L. D., Mayhan, K. T., Rhee, J. U., & Timberlake, D. S. (2024). A qualitative assessment of

- blunt smokers' perceptions and receptivity to non-tobacco blunt wraps. *J Stud Alcohol Drugs*. <https://doi.org/10.15288/jsad.23-00331>
- Phan, L., McNeel, T. S., & Choi, K. (2021). Prevalence of current large cigar versus little cigar/cigarillo smoking among U.S. adults, 2018-2019. *Prev Med Rep*, 24, 101534. <https://doi.org/10.1016/j.pmedr.2021.101534>
- Reboussin, B. A., Wagoner, K. G., Ross, J. C., Suerken, C. K., & Sutfin, E. L. (2021). Tobacco and marijuana co-use in a cohort of young adults: Patterns, correlates and reasons for co-use. *Drug Alcohol Depend*, 227, 109000. <https://doi.org/10.1016/j.drugalcdep.2021.109000>
- Rhee, J. U., Huang, Y., Soroosh, A. J., Alsudais, S., Ni, S., Kumar, A., Paredes, J., Li, C., & Timberlake, D. S. (2024). The Marketing and perceptions of non-tobacco blunt wraps on Twitter. *Subst Use Misuse*, 59(4), 469-477. <https://doi.org/10.1080/10826084.2023.2280572>
- Ribisl, K. M., Golden, S. D., Huang, J., & Scollo, M. (2022). Addressing lower-priced cigarette products through three-pronged comprehensive regulation on excise taxes, minimum price policies and restrictions on price promotions. *Tob Control*, 31(2), 229-234. <https://doi.org/10.1136/tobaccocontrol-2021-056553>
- Rogers, A. H., Shepherd, J. M., Buckner, J. D., Garey, L., Manning, K., Orr, M. F., Schmidt, N. B., & Zvolensky, M. J. (2020). Current cannabis use and smoking cessation among treatment seeking combustible smokers. *Drug Alcohol Depend*, 209, 107928. <https://doi.org/10.1016/j.drugalcdep.2020.107928>
- Rogers, T., Brown, E. M., Siegel-Reamer, L., Rahman, B., Feld, A. L., Patel, M., Vallone, D., & Schillo, B. A. (2022). A comprehensive qualitative review of studies evaluating the impact of local US laws restricting the sale of flavored and menthol tobacco products. *Nicotine Tob Res*, 24(4), 433-443. <https://doi.org/10.1093/ntr/ntab188>
- Rosenberry, Z. R., Schauer, G. L., Kim, H., & Peters, E. (2017). The use of flavored cigars to smoke marijuana in a sample of US adults co-using cigarettes and marijuana. *Tobacco Regulatory Science*, 3(2 Suppl 1), S94-S100.
- Rostron, B. L., Cheng, Y. C., Gardner, L. D., & Ambrose, B. K. (2020). Prevalence and reasons for use of flavored cigars and ENDS among US youth and adults: Estimates from Wave 4 of the PATH Study, 2016-2017. *Am J Health Behav*, 44(1), 76-81. <https://doi.org/10.5993/AJHB.44.1.8>
- Schauer, G. L., Hall, C. D., Berg, C. J., Donovan, D. M., Windle, M., & Kegler, M. C. (2016). Differences in the relationship of marijuana and tobacco by frequency of use: A qualitative study with adults aged 18-34 years. *Psychol Addict Behav*, 30(3), 406-414. <https://doi.org/10.1037/adb0000172>
- Schauer, G. L., Rosenberry, Z. R., & Peters, E. N. (2017). Marijuana and tobacco co-administration in blunts, spliffs, and mulled cigarettes: A systematic literature review. *Addict Behav*, 64, 200-211. <https://doi.org/10.1016/j.addbeh.2016.09.001>
- Schlienz, N. J., & Lee, D. C. (2018). Co-use of cannabis, tobacco, and alcohol during adolescence: policy and regulatory implications. *Int Rev Psychiatry*, 30(3), 226-237. <https://doi.org/10.1080/09540261.2018.1465399>

- Seaman, E. L., Green, K. M., Wang, M. Q., Quinn, S. C., & Fryer, C. S. (2019). Examining prevalence and correlates of cigarette and marijuana co-use among young adults using ten years of NHANES data. *Addict Behav*, 96, 140-147. <https://doi.org/10.1016/j.addbeh.2019.04.014>
- Seaman, E. L., Howard, D. E., Green, K. M., Wang, M. Q., & Fryer, C. S. (2019). A sequential explanatory mixed methods study of young adult tobacco and marijuana co-use. *Subst Use Misuse*, 54(13), 2177-2190. <https://doi.org/10.1080/10826084.2019.1638409>
- Shelley, D., Nguyen, N., Peng, C. H., Chin, M., Chang, M. D., & Fahs, M. (2010). Increasing access to evidence-based smoking cessation treatment: Effectiveness of a free nicotine patch program among Chinese immigrants. *J Immigr Minor Health*, 12(2), 198-205. <https://doi.org/10.1007/s10903-008-9194-7>
- Shrier, L. A., Walls, C., Rhoads, A., & Blood, E. A. (2013). Individual and contextual predictors of severity of marijuana use events among young frequent users. *Addict Behav*, 38(1), 1448-1456. <https://doi.org/10.1016/j.addbeh.2012.05.026>
- Simmons, V. N., Pineiro, B., Hooper, M. W., Gray, J. E., & Brandon, T. H. (2016). Tobacco-related health disparities across the cancer care continuum. *Cancer Control*, 23(4), 434-441. <https://doi.org/10.1177/107327481602300415>
- Smith, P. H., Bessette, A. J., Weinberger, A. H., Sheffer, C. E., & McKee, S. A. (2016). Sex/gender differences in smoking cessation: A review. *Prev Med*, 92, 135-140. <https://doi.org/10.1016/j.ypmed.2016.07.013>
- Sorensen, G., Emmons, K., Hunt, M. K., Barbeau, E., Goldman, R., Peterson, K., Kuntz, K., Stoddard, A., & Berkman, L. (2003). Model for incorporating social context in health behavior interventions: Applications for cancer prevention for working-class, multiethnic populations. *Prev Med*, 37(3), 188-197. [https://doi.org/10.1016/s0091-7435\(03\)00111-7](https://doi.org/10.1016/s0091-7435(03)00111-7)
- Sorensen, G., Quintiliani, L., Pereira, L., Yang, M., & Stoddard, A. (2009). Work experiences and tobacco use: Findings from the gear up for health study. *J Occup Environ Med*, 51(1), 87-94. <https://doi.org/10.1097/JOM.0b013e31818f69f8>
- Sorensen, G., Stoddard, A., Quintiliani, L., Ebbeling, C., Nagler, E., Yang, M., Pereira, L., & Wallace, L. (2010). Tobacco use cessation and weight management among motor freight workers: Results of the gear up for health study. *Cancer Causes Control*, 21(12), 2113-2122. <https://doi.org/10.1007/s10552-010-9630-6>
- Sterling, K. L., Fryer, C. S., & Fagan, P. (2016). The most natural tobacco used: A qualitative investigation of young adult smokers' risk perceptions of flavored little cigars and cigarillos. *Nicotine Tob Res*, 18(5), 827-833. <https://doi.org/10.1093/ntr/ntv151>
- Sterling, K. L., Jones, D. M., Majeed, B., Nyman, A. L., & Weaver, S. R. (2019). Affect predicts small cigar use in a national sample of US young adults. *Tob Regul Sci*, 5(3), 253-263. <https://doi.org/10.18001/TRS.5.3.4>
- Substance Abuse and Mental Health Services Administration. (2022). *Table 1.28B — Marijuana Use in Past Month: Among People Aged 12 or Older; by Age Group and Demographic Characteristics, Percentages, 2021 and 2022*. Retrieved

- April 25 from
<https://www.samhsa.gov/data/sites/default/files/reports/rpt42728/NSDUHDetailedTabs2022/NSDUHDetailedTabs2022/NSDUHDetTabsSect1pe2022.htm>
- Timberlake, D. S. (2009). A comparison of drug use and dependence between blunt smokers and other cannabis users. *Subst Use Misuse*, 44(3), 401-415. <https://doi.org/10.1080/10826080802347651>
- Trinidad, D. R., Perez-Stable, E. J., White, M. M., Emery, S. L., & Messer, K. (2011). A nationwide analysis of US racial/ethnic disparities in smoking behaviors, smoking cessation, and cessation-related factors. *Am J Public Health*, 101(4), 699-706. <https://doi.org/10.2105/AJPH.2010.191668>
- U.S. Food & Drug Administration. (2021). *Labeling and Warning Statements for Tobacco Products*. Retrieved February 3 from <https://www.fda.gov/tobacco-products/products-guidance-regulations/labeling-and-warning-statements-tobacco-products>
- Villanti, A. C., Johnson, A. L., Glasser, A. M., Rose, S. W., Ambrose, B. K., Conway, K. P., Cummings, K. M., Stanton, C. A., Edwards, K. C., Delnevo, C. D., Wackowski, O. A., Feirman, S. P., Bansal-Travers, M., Bernat, J. K., Holder-Hayes, E., Green, V. R., Silveira, M. L., & Hyland, A. (2019). Association of flavored tobacco use with tobacco initiation and subsequent use among US youth and adults, 2013-2015. *JAMA Netw Open*, 2(10), e1913804. <https://doi.org/10.1001/jamanetworkopen.2019.13804>
- Villanti, A. C., Sterling, K., & Rose, S. W. (2022). US Food and Drug Administration Action on menthol cigarettes and flavored cigars-A pivotal moment for health equity. *JAMA Netw Open*, 5(6), e2217150. <https://doi.org/10.1001/jamanetworkopen.2022.17150>