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Beyond blunts: Reasons for cigarette and cigar use among African American young adult dual users

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Abstract

Background—African American young adults are at high risk for dual use of cigarettes and cigars. Limited work has explored and characterized the reasons for use in this population and their relative importance for initiation and current smoking of these products.

Method—Reasons for cigarette and cigar use were systematically explored and categorized using a mixed methods participatory approach called concept mapping. A series of in-person group sessions were held with 30 African American young adult (ages 18-29) current smokers of both cigarettes and cigars in Prince George's County, MD and Washington, DC. Participants brainstormed, sorted, rated, and interpreted their reasons for initiation and past 30-day use of cigarettes and cigars. A cluster map was generated using multi-dimensional scaling, and t-tests were used to explore differences in ratings by background characteristics.

Results—Participants generated 64 reasons for smoking cigarettes and cigars, and categorized these reasons into six groups: emotions, urges, access, product characteristics, lifestyle, and

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Conflicts of Interest

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outside pressure. Emotions and urges were the most important motivations for initiation and current smoking of both products. Product characteristics were significantly more important for cigar initiation and smoking than for cigarettes, and outside pressure was more important for current smoking of cigars than cigarettes. Ratings differed by gender, socioeconomic status, and smoking characteristics.

Conclusions—Cigarette and cigar smoking have several overlapping motivations, but key differences were also found, most notably for product characteristics. The FDA's regulation of cigars and cigarettes should focus on addressing key characteristics appealing to young adults to curb dual use.

Keywords

dual use; cigars; reasons for use; concept mapping; young adults; smoking

Introduction

Tobacco use remains the leading cause of preventable disease, disability, and death in the US (U.S. Department of Health and Human Services 2014). Over 96% of adult daily cigarette smokers began smoking daily by the age of 26, and the health effects from smoking are already evident among smokers under age 30 (U.S. Department of Health and Human Services 2012). Although overall tobacco use has declined in the US population, past 30-day concurrent use of multiple tobacco products (i.e., polyuse) has increased among tobacco users under age 26 (Fix et al. 2014). Young adults are more likely to be polyusers than older adults, which has implications for both their health and ability to quit (Lee et al. 2014, Messer et al. 2015, Rath et al. 2012, Richardson et al. 2012). African Americans are more likely to be polyusers than non-Hispanic whites (Borawski et al. 2010, Richardson et al. 2012, Wong et al. 2016), which may partially explain their lower likelihood of cessation and greater risk of smoking-related disease (Centers for Disease Control and Prevention 2011, Haiman et al. 2006). In one nationally representative study with young adults, the prevalence of polyuse of cigarettes with other tobacco products was 7% overall and 11% among African Americans (Rath et al. 2012).

Dual use of cigarettes and cigars is one of the most popular forms of polyuse (Lee et al. 2014, Soneji et al. 2016). Among polyusers, about 76% smoke cigarettes, and 38% smoke a type of cigar called a cigarillo (Kasza et al. 2017). Cigarettes are the most popular tobacco product smoked among African Americans (21%) and young adults (20%), followed by cigars (12% and 14%, respectively) (Kasza et al. 2017). In addition to African American young adults, the risk of dual use and cigar smoking is higher among men and people with low socioeconomic status (SES) (Borawski et al. 2010, Cohn et al. 2015, Cullen et al. 2011, Fix et al. 2014). Like cigarettes, cigars are causally linked to morbidity and premature mortality (Baker et al. 2000, Chang et al. 2015). The Food and Drug Administration (FDA) has the authority to regulate cigarettes, and in May 2016 extended its authority to include cigars. Currently, cigars are not as strictly regulated as cigarettes, and the FDA has prioritized research on cigars (including use with other products) to assist in its regulatory decision-making. Mass produced cigars like little cigars and cigarillos (LCCs) are the most popular form of cigars (Corey et al. 2014, Messer et al. 2015). LCCs are similar to cigarettes

in terms of their size, inhalation behaviors, and nicotine exposure (Delnevo and Hrywna 2007, Koszowski et al. 2015). However, LCCs are cheaper due to a lower tax rate and pack size, and come in many flavors (e.g., candy, fruit, alcohol), which are attractive to young adults (Campaign for Tobacco-Free Kids 2016, Corey et al. 2014, Delnevo et al. 2015, Delnevo et al. 2017a, Delnevo and Hrywna 2007, Koszowski et al. 2015). Cigarillos are also popular as vehicles for marijuana by replacing some or all of the tobacco in the wrapper with marijuana (“blunts”) (Giovenco et al. 2016, Sterling et al. 2016a, Sterling et al. 2016b).

Beyond using LCCs as blunts, further research is needed to determine the reasons for cigarette and cigar smoking among dual users. Some studies have identified flavors, mood enhancement (e.g., relaxation), affect regulation (e.g., helps you calm down), greater affordability and longer burn time than cigarettes, and appealing packaging as important reasons for LCC use (Nyman et al. 2016, Sterling et al. 2015, Wong et al. 2016). However, these studies have not explicitly compared cigars to cigarettes in dual users to find overlapping and unique motivations for use of each product. Moreover, the importance of these motivations for initiation versus current use is unclear. Given the differences in cigar smoking and polyuse by gender and SES, reasons for cigarette and cigar use may differ by key demographic characteristics. Indeed, sensory effects (like the effects of flavors) are significant reinforcers of cigarette smoking for women, whereas nicotine is more important for men (Perkins et al. 2001, Zuo et al. 2015).

This study sought to determine the motivations for smoking cigarettes and cigars among African American young adult users of both products. It extends the previous literature by using concept mapping to: first, qualitatively explore the reasons for use of cigarettes and cigars; and second, systematically categorize and rate these reasons for initiation versus current use of each product. In addition, we explore differences in reasons for use by key demographic characteristics and smoking behaviors.

Methods

Overview

Concept mapping (CM) is a participatory method that uses a structured series of steps to qualitatively generate data and apply quantitative analytical tools to create a visual representation of a group’s perceptions and ideas (Burke et al. 2005, Kane and Trochim 2007). The process involves three main steps: (1) generating the ideas (brainstorming); (2) structuring the ideas (sorting, rating, and analysis); and (3) interpretation. In this study, participants completed brainstorming, sorting and rating, and interpreting activities in three separate in-person group sessions held in Prince George’s County, MD and Washington, DC. Participants signed written consent forms, and were compensated with \$25 at the conclusion of each session. The University of Maryland Institutional Review Board approved the study.

Recruitment

A convenience sample of participants were recruited through advertisements on Craigslist.com, word-of-mouth, and a local newspaper. Eligibility criteria included: (1) age 18-29 years; (b) self-identified as African American or black; (c) resident of Prince George’s

County or Washington, DC, and (d) current smokers of both cigarettes and cigars (smoked 4 cigarettes and 4 cigars in the past 30 days). Cigars were defined broadly as any type of cigar, including little cigars, cigarillos, and large cigars. Potential participants were screened for eligibility over the phone using a screening instrument. Prince George's County, MD and Washington, DC (hereafter, MD and DC) were chosen as the study sites because of the high percentage of African American residents (65% and 49%, respectively) and the difference in median income of African Americans between the two areas (\$34,524 and \$25,785, respectively) (U.S. Census Bureau 2014a, b). Of the 46 eligible individuals, 30 participated.

Data collection and analysis

Data collection occurred from June to August 2015. Group sessions were held separately for MD and DC residents in private community locations, such as conference rooms in libraries. For sessions 2 and 3, all prior participants were invited back, and new participants were recruited. The recruitment of new participants expanded the sample to: a) maximize the theoretical saturation and representativeness of viewpoints included in the sample, and b) maintain sufficient sample size after attrition. This approach has been used by other concept mapping studies (Burke et al. 2005, Frye et al. 2012, Ries et al. 2010). About half (n=14) participated in >1 session. The CM process was explained to all new participants to ensure reliability. During the sessions, the mixture of previous and new participants did not have any apparent effect on data generation. Participants completed a background and tobacco use history survey once. Demographic differences between groups who participated in sessions 1, 2, and 3 were tested using t-tests and chi-square or Fisher's exact tests. ELM facilitated the sessions, which lasted 1-1.5 hours, with the assistance of JS. Sessions were audio recorded and transcribed verbatim.

Generating the ideas

In the first session (n=8 in MD, n=9 in DC), participants were asked to discuss the definitions of cigars and cigarillos and the most popular brands. Next, the participants were asked to brainstorm based on the following focus prompt: "What are some reasons why you smoke cigarettes and cigar products?" The facilitator probed as needed on specific products (cigarettes, little cigars, cigarillos, and large cigars) and behaviors (initiation versus current smoking). After the initial brainstorming, the facilitator took the participants through the list, and through discussion combined duplicate items and removed irrelevant items. Saturation was reached between the groups, and the researchers combined the lists into one final list of 64 reasons.

Structuring the data

In the second session (n=8 in MD, n=8 in DC), participants individually completed two tasks: pile sorting and rating. First, participants were given index cards for each of the 64 items and asked to sort their cards into piles so that similar items were in the same pile. The pile sort was unstructured (no pre-determined number of piles), but participants could not place all the cards into their own separate piles, they could not place all the cards into one pile, and a card could only belong to one pile. They were asked to name their piles. After the pile sort was completed, participants were asked to rate each item about how important it was for: (1) why they smoked cigarettes in the past 30 days; (2) why they tried cigarettes

(even one or two puffs) for the first time; (3) why they smoked little cigars or cigarillos in the past 30 days; and (4) why they tried little cigars or cigarillos (even one or two puffs) for the first time. Responses were on a 5-point Likert scale (1=Not at all important to 5=Extremely important), which has been used in other concept mapping studies (Burke et al. 2005, Johnson et al. 2011). The researchers excluded large cigars from the rating task because participants rarely reported their use in the first session.

The pile sort and rating data were entered and analyzed using The Concept System® Global MAX™ software, a licensed program designed for CM analysis (Concept Systems Incorporated 2016). The researchers created a similarity matrix from the pile sort data, which is a square symmetric matrix of the number of participants who sorted each pair of items together (Kane and Trochim 2007). The matrix was analyzed using multi-dimensional scaling that locates each item as a separate point on a two-dimensional map, known as the point map (Kane and Trochim 2007). The point map provides a visual representation of the pattern of similarities and differences in how participants sorted the items. Each point represents one item, and more similar items (i.e., that were often sorted together) are located closer to each other on the map. More detailed information on multidimensional scaling can be found in Borg and Groenen (2005). The stress index is a goodness of fit statistic that assesses the similarity between the point map and the similarity matrix. The stress value equaled 0.27, which is consistent with other studies and indicates an acceptable fit (Kane and Trochim 2007, Rosas and Kane 2012).

Using Ward's algorithm, the point map was partitioned into non-overlapping clusters of similar items. The partition is represented visually on a cluster map, which shows similar points enclosed by boundaries. Following recommended procedures (Kane and Trochim 2007), the researchers compared a series of cluster maps beginning with 15 clusters down to 5 clusters to determine which map(s) would be the most appropriate, based on logic and their expertise. The researchers selected three possible cluster maps: 6-, 7-, and 8-cluster maps.

Interpretation

In the third and final session (n=11 in MD, n=8 in DC), the participants were given the three possible cluster solutions and asked to choose the most representative. Next, the participants chose a label that best represented the content in each cluster. Disagreements were resolved through discussion and voting. The researchers reconciled and finalized the two groups' cluster labels into one final cluster map.

The researchers conducted subsequent analyses to determine the individual and cluster average ratings of importance for past 30-day cigarette smoking, past 30-day cigar smoking, initiation of cigarette smoking, and initiation of cigar smoking. Following procedures employed by other CM studies, ratings were averaged for each item, followed by a cluster average of the items' averages (Frye et al. 2012, Johnson et al. 2011, Ries et al. 2010, Soule et al. 2016a, Soule et al. 2016b). Differences in cluster means by cigarettes and cigars were examined using t-tests. Differences by demographic variables were further explored using t-tests, including gender, SES (mother's education, weekly spending money, and employment status), daily smoking status, and product preference. Maternal education was used as a

measure of SES as it has been shown to be valid for this developmental period (Ensminger et al. 2000).

Results

Participant demographics and tobacco behaviors

The characteristics of the 30 participants are presented in Table 1. The mean age was 24.7 years, and 36.7% of the sample was women. Over half were employed part-time, and a third were unemployed. Ever use of marijuana in cigars was high (77%), as was the current use of additional nicotine or tobacco products (67%). Their average nicotine dependence assessed using the Fagerstrom Test for Nicotine Dependence was 3.4, indicating low dependence (Fagerstrom et al. 1990, Heatherton et al. 1991). The background characteristics of the participants did not statistically significantly differ between the three sessions.

Participants discussed a variety of brands that they considered to be cigars, including Al Capones, Cubans, Dutch Masters, Black & Milds, Games, Swishers, and Backwoods. The term “cigarillo” was used more inconsistently. It was not mutually exclusive from “cigars” and was typically used to describe blunts. Al Capone and Black & Mild cigarillo brands were never or rarely used for blunts.

Clusters and cluster ratings of reasons for initiation and current smoking

The final map included six clusters of 64 reasons for smoking cigarettes and cigars: Emotions, Urges, Access, Product Characteristics, Lifestyle, and Outside Pressure (Figure 1). Both the DC and MD groups chose the same number of cluster solutions.

Participants rated the importance of each item for initiation of cigarette and cigar smoking and past 30-day cigarette cigar smoking. Ratings were averaged across clusters (Figure 2). Items by cluster are shown in Table 2.

Emotions—This 16-item cluster described the perception that they smoked these products in response to both positive and negative emotions, like “when feeling stressed,” “helps me to relax,” or “helps me calm down.” It had the highest mean rating across all four smoking behaviors: initiation of cigarette smoking ($M=3.14$), initiation of cigar smoking ($M=3.20$), current cigarette smoking ($M=3.31$), and current cigar smoking ($M=3.37$), with no statistically significant difference by product.

Urges—This 5-item cluster included feelings of dependence and craving, including two items about marijuana. It had the second highest mean rating across all four smoking behaviors ($M=3.00$ for cigarette initiation, $M=3.03$ for cigar initiation, $M=3.06$ for current cigarette smoking, $M=3.23$ for current cigar smoking). There were no statistically significant differences by product, indicating that urges were equally important for cigars and cigarettes. Items related to marijuana use were rated as the most important reasons for cigar initiation (“after smoking weed, to keep my high” $M=3.81$) and current smoking (“used the leaf wrapper to put weed in it” $M=3.94$). Participants who smoked blunts discussed their cravings for marijuana in addition to tobacco.

Access—This 6-item cluster referred to issues around the accessibility and availability of the products. It was the third highest rated cluster for initiation of cigarette ($M=2.68$) and cigar smoking ($M=3.00$), with no difference by product. Pack size was rated higher for cigar than for cigarette initiation (3.25 vs. 2.69). Participants described how the availability of packs of one to three cigars was an attractive feature that enhanced accessibility, particularly for initiation, because it was easier to hide from their parents than a pack of cigarettes and because they only wanted to smoke a little bit. Insufficient money for the preferred tobacco product was also rated higher for cigar than cigarette initiation (3.19 vs. 2.19) and current smoking (3.31 vs. 2.75). Participants discussed how they smoked cigars when they did not have enough money for cigarettes.

Product characteristics—This 19-item cluster described the attractive characteristics of cigarettes and cigars, including physical (e.g., size, flavor, burn rate), sensory (e.g., taste, aftertaste, smell), and psychosocial (e.g., less taboo, less harmful, easier to quit). It was the third highest rated for current cigar smoking ($M=3.20$). Participants rated product characteristics as more important for cigar initiation and current smoking than for cigarette initiation (2.88 vs. 2.44, $p=0.0012$) and current smoking (3.20 vs. 2.73, $p=0.0006$). For cigars, the ability to put it out and smoke it again later was the most important reason for current smoking ($M=3.81$). Inexpensiveness compared to other products was the most important reason for initiation, and was more important for cigar than cigarette initiation (3.44 vs. 2.81).

Lifestyle—This 6-item cluster described outside factors that make them want to smoke and not because of addiction, such as drinking alcohol, lack of money for marijuana, and smoking as a hobby. It was the third highest rated for current cigarette smoking ($M=3.03$). Ratings did not differ by product. Alcohol consumption was more important for current cigarette than cigar smoking (4.06 vs. 3.13). In contrast, insufficient money to buy marijuana was rated more highly for cigar than cigarette initiation (3.19 vs. 2.56) and current smoking (3.31 vs. 3.06).

Outside pressure—This 12-item cluster included social factors that made participants feel some pressure to smoke the products, such as influences in their immediate social networks (e.g., my girlfriend/boyfriend smokes), social groups (e.g., wanting to fit in), broader social environment or neighborhood (e.g., everybody smokes it), and the media (e.g., a celebrity or rapper smokes it). It had the lowest rating across all four smoking behaviors, but was more important for current cigar than cigarette smoking (2.39 vs. 1.89, $p=0.0048$). In discussions, it was the most controversial cluster because participants believed it influenced other people, and not themselves. They stated more often that it influenced their initiation of smoking than their current smoking.

Comparisons by key traits for initiation

We examined differences in mean ratings for smoking initiation by key demographic characteristics (Table 3). For cigar initiation only, participants with low SES – measured by mother's educational status – rated Access and Lifestyle as more important than those with higher SES. For women, Emotions were more important for cigarette initiation than men;

conversely, Emotions were more important for cigar initiation among men than women. Product characteristics were more important for cigar initiation among men and current nondaily smokers.

Comparisons by key traits for current smoking

Mean cluster ratings for current smoking also differed by key characteristics (Table 4). Participants with low SES—in terms of their weekly spending money and employment status—rated Product Characteristics, Access, Urges, and Emotions as more important for current cigar smoking than higher SES participants. Comparing participants by preferred product, Emotions were more important for current cigarette smoking among participants who prefer cigarettes than for those who prefer cigars. In contrast, Product Characteristics were more important for current cigar smoking among those who prefer cigars than those who prefer cigarettes. Notably, nondaily smokers rated Product Characteristics higher for current cigar smoking than daily smokers; however, daily smokers rated Product Characteristics higher for current cigarette smoking.

Discussion

Using a systematic participatory technique, this study found six key reasons why African American young adults smoke both cigarettes and cigars: emotions, urges, access, product characteristics, lifestyle, and outside (social) pressure. This group is one of the populations at highest risk for concomitant smoking (Borawski et al. 2010, Fix et al. 2014), and understanding their reasons for using both products is an important first step for intervention development and policy-making to eliminate this disparity. Our findings reveal a complex, multilevel picture of the motivations for product use, covering personal, product, and contextual factors. This suggests the necessity of a multi-pronged approach of individual- and community-level interventions to address emotions, addiction, and social norms coupled with policy-level changes to products and access in order to reduce dual use. Several themes emerged from the data that addressed use of both products (e.g., emotions, urges). Cessation programs or policies that incorporate these themes could see a reduction of dual cigarette and cigar use among this population. Other themes addressed the relative importance of one product versus the other (e.g., product characteristics, lifestyle). Further, cessation programs and regulatory policies might be able to reduce the use of one of the products by targeting these reasons for use.

Emotional factors played the biggest role in both cigarette and cigar smoking, particularly coping with negative emotions like the need to calm down. In a population of college students who were single product users, Wong et al. (2016) also found that negative affect regulation was an important reason for smoking LCCs. Smoking can be used as a form of self-medication for negative affect, but evidence also suggests that smoking can increase the risk of negative affect (Kassel et al. 2003). Negative emotional states—like anxiety and irritability—are classic symptoms of nicotine withdrawal, further complicating the relationship between emotions and smoking (Hughes 2007). Overall, our findings highlight the need for interventions to help young dual users better manage their negative affect or

change their expectations of smoking's assistance with coping, in order to encourage cessation of both products.

We found that urges and product characteristics were important for cigar initiation and current smoking, especially for low SES and nondaily smokers. Urges were rated as equally important for cigars as for cigarettes, suggesting nicotine dependence as an important factor in cigar smoking. Tobacco companies have reformulated cigars to make them more cigarette-like in terms of size, weight, filters, ease of inhalation, and nicotine delivery, and marketed them as cigarette substitutes (Delnevo and Hrywna 2007, Delnevo et al. 2017b, Kostygina et al. 2016, Koszowski et al. 2015). Cigars have attractive features not found in cigarettes that appeal to young people. Inexpensiveness, flavor, taste, burn rate, and small pack size were some of the most attractive cigar features identified by the participants, which is consistent with other studies (Giovenco et al. 2016, Nyman et al. 2016). A minimum pack size requirement for non-premium cigars, a taxation rate similar to cigarettes, minimum price restrictions, and banning flavored varieties are potential measures to decrease the prevalence of cigar smoking, discourage product switching, and reduce cigar initiation among African American young adults.

Previous studies have highlighted the significant and complex interplay of marijuana and cigars in similar populations, and the co-occurrence of marijuana and tobacco is increasing (Koopman Gonzalez et al. 2015, Kostygina et al. 2017, Schauer et al. 2015, Sterling et al. 2016a). Our findings add to this literature by illustrating the role of marijuana in cigar initiation and current smoking in a population who also smoke cigarettes. Participants who smoked marijuana qualitatively reported strong cravings for marijuana, and for many of them marijuana was the preferred product. In addition to the risk of marijuana addiction (Volkow et al. 2014), blunt smokers are exposed to nicotine in the cigar wrapper, thus enhancing the potential for dependence (Peters et al. 2016).

This study also found brand differences that require further research. For example, Black & Milds were never or rarely used for blunts, which supports findings from other qualitative studies (Giovenco et al. 2016, Koopman Gonzalez et al. 2015, Stephens et al. 2015). In addition to the popularity of Black & Milds and Backwoods found in other research (Delnevo et al. 2014), we found high popularity of a flavored brand called Al Capones, suggesting possible regional differences in brand preferences. Al Capones present a challenge to survey measurement since they come in filtered and unfiltered varieties and are the size of little cigars, but labeled "mini cigarillos." Misclassification bias can occur on survey questions about cigars when brand-specific examples are not included, and LCC smokers often use different terminology than researchers to describe cigars (Stephens et al. 2015, Terchek et al. 2009, Trapl et al. 2011). Therefore, the inclusion of Al Capones as a brand-specific example on surveys might be warranted.

A significant concern for multiple product use is *how* non-cigarette products are used concomitantly with cigarettes, such as additively (that is, with no reduction in cigarette consumption) or bridging to alleviate cravings when cigarettes cannot be smoked. Based on our findings, cigars appear to be good substitutes to bridge cravings when dual users have insufficient funds for cigarettes or marijuana. However, cigars may also fulfill certain

purposes or functions better than cigarettes, such as social pressures in smoking or desires to try new products and flavors.

This study had several limitations. We focused on a high-risk population for dual use, which limits the generalizability of our findings to other populations. Craigslist and word-of-mouth were the primary recruitment sources, and so the sample may not be representative of other African American young adults in Prince George's County, MD and Washington, DC metropolitan area. However, other studies have shown online recruitment to be an effective strategy for young adults (Ramo et al. 2010). Blunts were a significant reason for LCC smoking, but this study was unable to differentiate the reasons for unaltered LCC versus blunt smoking. Reasons for use of these two products might differ, and could be explored in future studies. Generalizability of findings may be a concern, particularly since some participants took part in only one session. The MD and DC groups separately generated the same brainstorming list and selected the same cluster map, which enhances our confidence in the confirmability and trustworthiness of the findings. The use of a mixed methods approach to collect and analyze participant-generated data was a major strength of the study. We were able to reach saturation on the reasons for cigarette and cigar use, empirically derive a thematic cluster map of their reasons, and qualitatively explore their perceptions and interpretation of the map in-depth.

Conclusions

The findings from this research suggest that cigars are used for a variety of reasons within the context of cigarette smoking. Some reasons between cigar and cigarette smoking overlap (e.g., to deal with negative emotions and satisfy nicotine addiction), but other reasons are primary drivers for cigar initiation and smoking (e.g., product characteristics). In 2016, the FDA Center for Tobacco Products extended its regulatory authority to include cigar products. To regulate cigars appropriately, the FDA and state lawmakers must consider those characteristics of cigars that increase their appeal to young people and encourage dependence, including flavors, cost, and pack size. By banning flavors, increasing taxes, and implementing minimum pack size and price restrictions, regulatory agencies can reduce cigar initiation, prevalence, and bridging or switching from cigarettes. Cigars are disproportionately used by minority young adults, which makes them vulnerable to the deleterious effects of tobacco-related health challenges beginning early in their lives. Therefore, reducing cigar appeal could significantly impact smoking-related disparities amongst US residents, in general, and amongst minority young adults, in particular. Importantly, this study is among the first to systematically explore and characterize the reasons for smoking cigarettes and cigars among current dual users. The statements and clusters identified through concept mapping can inform the development of an instrument to assess population-level reasons for cigarette and cigar smoking among dual users. These types of studies are important as multiple product use increases in the US among all groups of smokers.

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Appendix A

Table A1

Sixty-four items by cluster with mean averages (n=16)

Clusters & Items	Cigarette Initiation	Cigar Initiation	Current Cigarette Smoking	Current Cigar Smoking
Emotions				
I enjoy it	3.44	3.81	3.88	3.75
Helps me relax	3.88	3.69	4.00	3.94
Helps me calm down	3.81	3.63	3.94	4.06
Helps me to think or gives me time to think	2.81	3.56	3.50	3.19
Gives me time to myself	3.13	3.50	3.50	3.88
Feeling stressed	4.00	3.44	3.75	3.63
Feeling happy or in a good mood	3.06	3.44	3.19	3.31
Feeling anxious	3.19	3.25	3.25	3.06
Helps me deal with anger	2.94	3.19	3.5	3.63
Feeling excited	2.81	3.19	2.88	2.94
It's satisfying	3.38	3.13	3.81	3.81
Helps when I am feeling worried	3.50	3.13	3.50	3.44
Reward to myself	3.06	3.06	2.75	3.38
When I am in physical pain, it helps me to feel better	2.94	2.5	2.81	2.94
Feeling depressed or sad	2.56	2.44	2.81	2.94
Gives me more energy	1.81	2.25	1.94	2.06
Urges				
After smoking weed, to keep my high or keep me afloat	3.25	3.81	3.00	3.31
Used the leaf wrapper to put weed in it (like a blunt)	3.19	3.63	3.13	3.94
Feeling bored, had nothing to do, or needed to kill time	3.27	3.13	3.19	3.00
Got to have it to feel right, because of an urge or craving	2.56	2.31	3.19	3.06
I am dependent on, addicted to, or hooked on it	2.75	2.25	2.81	2.81
Access				

Clusters & Items	Cigarette Initiation	Cigar Initiation	Current Cigarette Smoking	Current Cigar Smoking
It's easy to get	3.88	3.63	3.69	3.63
The amount that comes in one pack or package	2.69	3.25	3.00	3.13
Money was low or tight and I couldn't get the tobacco product I prefer	2.19	3.19	2.75	3.31
Smoking it is part of my identity as a smoker	2.00	2.88	2.63	3.31
It's easier to hide from my family or others than other tobacco products	2.56	2.56	1.81	2.38
To help me quit or smoke less weed	2.75	2.50	2.38	2.94
Product Characteristics				
It's inexpensive or cheaper than other tobacco products	2.81	3.44	3.25	3.50
Wanted to try a new product or flavor	3.31	3.31	2.50	3.50
The strength or mildness of it is just right for me	2.75	3.31	3.13	3.31
To help me quit or smoke less of another tobacco product	2.69	3.31	2.75	3.13
The side effects aren't as bad as other tobacco products	2.19	3.31	2.56	3.13
Better quality than other tobacco products	2.50	3.25	3.25	3.19
It's less harmful than other tobacco products	2.13	3.13	2.75	3.25
It has less chemicals in it or is more natural than other tobacco products	2.19	3.00	2.81	3.31
The aftertaste	2.25	3.00	2.56	3.00
It's less harsh than other tobacco products	2.50	2.88	3.19	3.25
How it smells	2.56	2.88	2.50	2.69
I can put it out and smoke it again later (burn rate)	2.19	2.81	2.75	3.81
How long or how fast it takes to smoke it	1.94	2.81	2.06	3.13
The size of it	1.88	2.69	1.94	3.25
The taste of it	2.63	2.63	3.25	3.50
It's smoother than other tobacco products	2.69	2.56	3.38	3.31
The flavor of it	2.88	2.25	2.69	3.50
It's easier to quit this tobacco product than it is to quit other tobacco products	2.13	2.19	2.63	2.81

Clusters & Items	Cigarette Initiation	Cigar Initiation	Current Cigarette Smoking	Current Cigar Smoking
It's less taboo or more acceptable to smoke it than other tobacco products	2.25	2.00	2.00	2.25
Lifestyle				
Drinking alcohol or being drunk makes me smoke it	3.50	3.56	4.06	3.13
Money was low or tight and I couldn't get weed	2.56	3.19	3.06	3.31
Smoking a particular brand is part of my lifestyle	2.69	3.13	3.25	2.75
Smoking it as a hobby	2.50	3.06	2.81	3.31
The physical habit, like the sensation of hold it, the physical motions of smoking it, or oral fixation	2.50	2.81	3.25	3.06
To keep my weight down, lose weight or control my appetite	1.69	1.81	1.75	1.75
Outside Pressure				
Curiosity or to try it	3.50	3.19	2.44	3.00
Someone recommended it to me	2.88	3.19	2.19	2.75
Someone gave it to me	3.13	3.00	2.44	3.00
Saw others smoking it	2.44	2.69	1.63	2.56
Everybody smokes it	2.13	2.38	1.94	2.06
Feeling pressure to smoke it from friends and others	1.81	2.19	1.63	2.63
Because my friends smoke it	2.25	2.19	2.00	2.25
My family smokes	2.50	2.19	2.25	1.81
To look cool or boost my image	1.94	2.13	1.31	1.63
Wanting to fit in with others who smoke it	1.63	2.06	1.81	2.31
A celebrity or rapper smokes it or promotes it	1.56	2.00	1.38	2.25
My girlfriend or boyfriend smokes	2.00	1.63	1.69	2.44

N=16 participants completed the ratings task.

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Figure 1.

Cluster map for reasons for smoking cigarettes and cigars. Each point represents an item that was generated and sorted by participants (64 in total). Points that are closer together represent items that were sorted together more often, on average, by participants, while points that are farther apart were sorted together less frequently or not at all. Clusters that are closer together are more similar to each other than clusters that are farther apart.

Figure 2.

Average cluster ratings for cigarette and cigar initiation (top panel) and for current cigarette and cigar smoking (bottom panel). *Statistically significant product difference ($p < 0.05$).

Table 1

Demographic and tobacco use characteristics of the study participants (N=30)

Characteristic	N or Mean	% (or SD)
Age, Mean (SD)	24.7	(3.3)
Gender		
Male	19	63.3%
Female	11	36.7%
Marital status		
Legally married/ cohabitating	9	30.0%
Separated/divorced	3	10.0%
Single	18	60.0%
Currently enrolled in school		
No	23	76.7%
Part-time	6	20.0%
Full-time	1	3.3%
Employment status		
Full-time	3	10.0%
Part-time	16	53.3%
Homemaker	1	3.3%
Unemployed	10	33.3%
Weekly spending money		
<\$200	14	48.3%
\$200	15	51.7%
Mother's educational status		
Less than high school, completed high school, received a GED	15	50.0%
Completed some or all of a technical/vocational/trade school or 2-year college	9	30.0%
Completed some 4-year college or higher	6	20.0%
First nicotine or tobacco product ever tried		
Cigarettes	19	63.3%
Cigars	10	33.3%
Roll your own cigarettes	1	3.3%
Age first tried cigarettes, Mean (SD)	15.0	(2.8)
Age first tried cigars, Mean (SD)	15.9	(3.5)
Smoked 100 cigarettes in lifetime		
No	5	16.7%
Yes	25	83.3%
Smoked 100 cigars in lifetime		
No	7	23.3%
Yes	23	76.7%
Average number of cigarettes smoked each day, on days they smoked, Mean (SD)	8.0 Median: 5.0	(9.3)
Average number of cigars smoked each day, on days they smoked, Mean (SD)	8.1 Median: 4.0	(11)
Cigarette brand currently smoked most often		

Characteristic	N or Mean	% (or SD)
Newport	24	80.0%
Marlboro Menthol	2	6.7%
Other	4	13.3%
Cigar brand currently smoked most often		
Black & Mild	7	24.1%
Backwoods	9	31.0%
Al Capones	6	20.7%
Other	7	24.1%
Preferred product		
Cigarettes	17	56.7%
Cigars	10	33.3%
No preference/Don't know	3	10.0%
Ever use of marijuana in cigars		
No	7	23.3%
Yes	23	76.7%
Daily cigarette smoker in past 30 days		
No	9	30.0%
Yes	21	70.0%
Daily cigar smoker in past 30 days		
No	20	66.7%
Yes	10	33.3%
Dual smoking in past 30 days		
Nondaily smoker of both cigarettes and cigars	9	30.0%
Daily smoker of cigarettes, nondaily smoker of cigars	11	36.7%
Daily smoker of both	10	33.3%
Use of 1 additional nicotine or tobacco products in past 30 days ¹		
No	10	33.3%
Yes	20	66.7%
Fagerstrom Test for Nicotine Dependence score ² , Mean (SD)	3.4	(2.1)
Number of concept mapping sessions attended		
One session	16	53.3%
Two sessions	6	20.0%
Three sessions	8	26.7%

¹The most popular products were e-cigarettes (n=13) and roll-your-own cigarettes (n=13), followed by hookah (n=8).

²Based on Heatherton et al. (1991).

Table 2

Mean (SD) cluster ratings of importance for initiation of and past 30-day cigarette and cigar smoking (n=16)

Clusters	Cigarette Initiation	Cigar Initiation	p-value	Current Cigarette Smoking	Current Cigar Smoking	p-value
Emotions (16 items)	3.14 (0.53)	3.20 (0.44)	0.7522	3.31 (0.54)	3.37 (0.50)	0.7516
Urges (5 items)	3.00 (0.29)	3.03 (0.65)	0.9392	3.06 (0.14)	3.23 (0.39)	0.4075
Access (6 items)	2.68 (0.60)	3.00 (0.40)	0.2967	2.71 (0.57)	3.11 (0.39)	0.1817
Product Characteristics (19 items)	2.44 (0.36)	2.88 (0.41)	0.0012	2.73 (0.42)	3.20 (0.34)	0.0006
Lifestyle (6 items)	2.57 (0.53)	2.93 (0.55)	0.2793	3.03 (0.69)	2.89 (0.54)	0.6921
Outside Pressure (12 items)	2.31 (0.58)	2.40 (0.48)	0.6871	1.89 (0.37)	2.39 (0.41)	0.0048

N=16 participants completed the ratings task.

Table 3

Mean cluster ratings of importance for the initiation of cigarette and cigar smoking by demographic and tobacco use characteristics (n=16)

		Emotions	Urges	Access	Product Characteristics	Lifestyle	Outside Pressure
<i>Initiation of cigarette smoking</i>							
Gender	Men (n=9)	2.93	3.24	2.83	2.55	2.57	2.32
	Women (n=7)	3.42	2.82	2.48	2.31	2.57	2.57
	<i>p</i> -value	<0.05	NS	NS	NS	NS	NS
	Mother's educational status						
Mother's educational status	HS/GED completed or less (n=8)	3.53	3.18	2.88	2.58	2.75	2.21
	Completed more than HS (n=8)	2.76	2.82	2.48	2.31	2.40	2.42
Daily dual use	<i>p</i> -value	<0.001	NS	NS	NS	NS	NS
	Nondaily smoker (n=7)	3.28	2.94	2.38	2.31	2.71	2.12
Daily smoker [†] (n=9)	<i>p</i> -value	NS	NS	NS	NS	NS	NS
	Daily smoker [†] (n=9)	3.04	3.05	2.91	2.55	2.46	2.46
<i>Initiation of cigar smoking</i>							
Gender	Men (n=9)	3.51	3.38	3.31	3.18	3.17	2.65
	Women (n=7)	2.79	2.57	2.60	2.50	2.62	2.08
	<i>p</i> -value	<0.001	NS	<0.05	<0.001	NS	<0.02
	Mother's educational status						
Mother's educational status	HS/GED completed or less (n=8)	3.68	3.43	3.33	3.05	3.23	2.58
	Completed more than HS (n=8)	2.72	2.63	2.67	2.72	2.72	2.22
Daily dual use	<i>p</i> -value	<0.001	NS	<0.05	NS	<0.05	NS
	Nondaily smoker (n=7)	3.25	3.23	2.83	3.16	2.81	2.58
Daily smoker [†] (n=9)	<i>p</i> -value	NS	NS	NS	<0.01	NS	NS
	Daily smoker [†] (n=9)	3.16	2.87	3.13	2.67	3.02	2.26

[†]Daily smoker of cigarettes and/or cigars.

NS: not statistically significant at .05.
HS: high school.

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Mean cluster ratings of importance for past 30-day (current) cigarette and cigar smoking by demographic and tobacco use characteristics (n=16)

Table 4

	Emotions	Urges	Access	Product Characteristics	Lifestyle	Outside Pressure
Current cigarette smoking						
Gender						
Men (n=9)	3.15	3.18	2.87	2.95	3.04	2.03
Women (n=7)	3.56	2.91	2.50	2.45	3.02	1.71
p-value	NS	NS	NS	<0.005	NS	NS
Weekly spending money						
<\$200 (n=7)	3.40	3.51	2.88	3.29	3.21	1.88
\$200 (n=9)	3.24	2.71	2.57	2.30	2.89	1.90
p-value	NS	<0.01	NS	<0.001	NS	NS
Employment status ¹						
Employed (n=10)	3.29	3.04	2.80	2.66	3.02	1.94
Not employed (n=6)	3.34	3.10	2.56	2.86	3.06	1.81
p-value	NS	NS	NS	NS	NS	NS
Product preference ²						
Cigarette (n=8)	3.71	3.23	2.77	2.76	3.08	1.90
Cigar (n=6)	2.80	2.80	2.69	2.78	2.94	1.82
p-value	<0.001	NS	NS	NS	NS	NS
Daily dual use						
Nondaily smoker (n=7)	3.10	2.89	2.33	2.50	2.71	1.57
Daily smoker ³ (n=9)	3.48	3.20	3.00	2.91	3.28	2.14
p-value	NS	NS	NS	<0.02	NS	<0.005
Current cigar smoking						
Gender						
Men (n=9)	3.75	3.47	3.44	3.54	3.02	2.83
Women (n=7)	2.88	2.91	2.69	2.76	2.71	2.71
p-value	<0.001	NS	<0.05	<0.001	NS	NS

	Emotions	Urges	Access	Product Characteristics	Lifestyle	Outside Pressure
Weekly spending money						
<\$200 (n=7)	3.51	3.74	3.33	3.67	3.00	2.46
\$200 (n=9)	3.26	2.82	2.94	2.84	2.80	2.33
<i>p</i> -value	NS	<0.05	NS	<0.001	NS	NS
Employment status ¹						
Employed (n=10)	3.16	3.14	2.80	3.09	2.73	2.28
Not employed (n=6)	3.72	3.37	3.64	3.38	3.14	2.57
<i>p</i> -value	<0.005	NS	<0.01	<0.05	NS	NS
Product preference ²						
Cigarette (n=8)	3.27	3.08	3.06	2.88	2.71	2.23
Cigar (n=6)	3.32	3.43	3.31	3.70	3.19	2.33
<i>p</i> -value	NS	NS	NS	<0.01	NS	NS
Daily dual use						
Nondaily smoker (n=7)	3.60	3.77	3.19	3.67	3.24	2.63
Daily smoker ³ (n=9)	3.19	2.80	2.80	2.84	2.61	2.20
<i>p</i> -value	<0.05	<0.02	<0.05	<0.001	NS	NS

¹Employed includes full- and part-time employment. Not employed includes being a homemaker and unemployed.

²Two participants responded “no preference” or “don’t know,” and were excluded.

³Daily smoker of cigarettes and/or cigars.
NS: not statistically significant at 0.05