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Associations of Tobacco Advertising Appeal with Intentions to Use Alternative Tobacco Products Among Young Tobacco Users Experiencing Homelessness

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Abstract

Purpose—Virtually nothing is known about the potential effects of tobacco advertising on tobacco use among youth experiencing homelessness, a vulnerable population with high tobacco use rates. This study examines associations between the appeal of advertising for five classes of tobacco product (electronic cigarettes, hookah, cigars, cigarillos, smokeless tobacco) and future intentions to use those products again among homeless youth that had indicated any level of lifetime use.

Design—A cross-sectional design was used.

Setting—Settings were 25 service and street sites in Los Angeles County.

Participants—A probability sample of 469 young tobacco users experiencing homelessness (mean age=22; 71% male; 29% non-Hispanic White) was recruited.

Measures—Assessments included product-specific tobacco advertising appeal and future intentions to use the product again, as well as a range of covariate controls (e.g., demographics, homelessness severity, current tobacco use, general advertising exposure).

Analysis—Linear regression tested for associations between the appeal of advertising for a specific tobacco product and intentions to use that product again in the future, controlling for myriad covariates.

Results—Advertising appeal was positively associated with future intentions to use again: electronic cigarettes ($p=0.006$) and hookah ($p=0.001$), but not cigars ($p=0.486$), cigarillos ($p=0.126$), or smokeless tobacco ($p=0.109$).

Conclusion—Results suggest that advertising appeal may increase use of certain tobacco products among youth experiencing homelessness. However, differences in themes emphasized by advertising for specific tobacco products could differentially influence use in this population.

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Declaration of Conflicting Interests

The authors declare that there are no conflicts of interest.

Keywords

tobacco; homelessness; young adults; tobacco regulations

Introduction

Most (70%) unaccompanied youth experiencing homelessness are cigarette smokers.^{1,2} Of these current smokers, over 70% are concurrent users of alternative tobacco products (ATPs), such as electronic nicotine delivery systems (ENDS), hookah, cigars, little cigars/cigarillos (LCCs), and smokeless tobacco.^{3,4} Rates of cigarette smoking and ATP use among homeless youth are higher than in young adults in general.⁵ Cigarette smoking contributes significantly to morbidity and mortality⁶ and dual use of cigarettes and ATPs likely potentiates the health risks associated with smoking alone,⁷ increases nicotine dependence,⁸ and diminishes the likelihood of successful smoking cessation.⁹ Emerging research has identified numerous factors that are associated with use of different ATPs in homeless youth.⁴ Some factors are associated with use of several different products, such as being around others that use the products, whereas other factors appear to be more product-specific (e.g., depressed mood is associated with ENDS use only; cost is associated with LCC use only).⁴

However, the specific role of tobacco advertising in predicting use has not been investigated. A systematic review of internal tobacco industry documents indicated that homeless persons have been actively targeted by the tobacco industry through cigarette giveaways, coupons, and development of lower cost brands.¹⁰ Moreover, qualitative research has revealed that homeless adults are aware that they have been targeted by the industry and feel exploited as a result.¹¹ Although there are no data yet linking exposure to tobacco advertising to use in homeless populations, in the general population exposure to tobacco advertising and marketing contributes to increased tobacco use. Exposure to cigarette advertising contributes to adolescent cigarette smoking.¹² Evidence for other tobacco products is sparser, but suggestive: exposure to advertising for ENDS is associated with adolescent's increased use of e-cigarettes;^{13,14} advertising for cigars is associated with use in young people;^{15,16} and exposure to smokeless tobacco advertising contributes to adolescent smokeless use.^{17,18} There is a need to understand more about whether and how tobacco advertising is related to tobacco use among homeless persons, particularly among young people where advertising may have its most potent effects.¹²

The extent to which advertising appeals to or is liked by consumers is critical to determining its persuasive efficacy.^{19,20} Tobacco advertising is no exception: Young people who find tobacco advertising more appealing and more likeable, and who have a favorite tobacco advertisement are more likely to use tobacco.^{21–24} Because advertising for different products often emphasizes different features or themes^{25,26} it is important to examine relationships between product advertising and use for each product separately. For example, ENDS advertising often emphasizes harm reduction,²⁷ that use signifies independence and is normative,²⁸ that the product can be used when cigarette smoking is prohibited,²⁹ and that the product comes in myriad flavors.³⁰ Hookah use has been marketed as a healthier tobacco use option, as possessing pleasing flavors, as safe,³¹ and as being a social activity.³² Cigars

are often marketed to suggest that the product is associated with an upscale lifestyle.³³ LCCs are marketed to emphasize a “party” lifestyle,²⁷ as having a relatively lower cost than cigarettes,³⁴ and as coming in a host of flavors.³⁵ Finally, smokeless tobacco has been advertised as a masculine, individualistic product with emphasis sometimes placed on taste.^{29, 36} These diverse themes are reflected by the collective presence or absence of text, persuasiveness of advertising messaging and the tone of that messaging, presence or absence of spokespeople and qualities (e.g., attractiveness) of those persons displayed in the advertising, and so on. All these features contribute to the appeal of an advertisement.^{37–40}

The primary goal of this study was to examine the relationship between the appeal of advertising for five classes of tobacco product (ENDS, hookah, cigars, LCCs, smokeless tobacco) and future intentions to use those products among youth experiencing homelessness that had some level of lifetime experience with the product in question. Understanding more about the role of tobacco advertising in promoting tobacco use in homeless populations would help inform policies and regulations designed to limit this at-risk population’s exposure. Because of the relationships between demographic variables, past and current tobacco use, general advertising exposure, and use intentions,^{4,18,46–50} we controlled for these variables in our analyses.

Methods

Study Design

A probability sample of youth experiencing homelessness was recruited from service sites and street venues in Los Angeles County between August 2017 and April 2018. We adopted a multi-stage design because a list or sampling frame of all the homeless youth in the study area was not available. In the first phase, sites were selected, and two sampling frames were developed: one for service sites (shelters and drop-in centers) and one for street venues. The service site sampling frame was developed using local directories of sites providing services for homeless persons. Such sites were eligible if they were in the study area and if most of their clients were between 13 and 25 years old and English speaking. Using these criteria, 12 service sites for youth experiencing homelessness (2 overnight shelters, 10 drop-in centers that provide daytime services) were identified as eligible and agreed to participate. The street venue sampling frame was developed with the assistance of outreach agencies and service providers, as well as informed by our experience with previous studies of this population.^{3,4} A total of 13 street sites (e.g., parks, alleys, sidewalks, beaches) where homeless youth congregate were identified. Each of the sites, across sampling frames, was investigated many times and at different times of day to obtain an estimate of the average number of youths served daily by the service sites and the average number of youths that “hang out” at the street venues on a given day. Information collected through these site investigations was used to allocate the sample proportional to the estimated size of each site (i.e., the sample size for each site was approximately proportional to the size of that site, such that more interviews were completed at sites with larger numbers of youth). In the second phase, a probability sample of homeless youth from the 25 study sites was drawn. Strategies specific to the type of site were developed to randomly select the youths that were to be approached, screened and surveyed. For example, at drop-in centers survey staff

obtained a copy of the drop-in center sign-in sheet and then used random number tables to determine the order in which they would approach youth for eligibility screening. For street sites, survey staff walked clockwise along the block (randomly selecting which end of the block was the starting point), approaching all potentially eligible youth for screening in the order in which they were encountered.

Study Participants

A sample of 469 youth experiencing homelessness was randomly drawn from 25 service and street sites in Los Angeles County, as described below. Eligibility criteria were as follows: (a) ages of 13–25; (b) not currently living with a parent or guardian; (c) not getting most of their support for food and housing from family or a guardian; (d) spent the previous night in a shelter, outdoor or public place, hotel or motel room rented with friends (because of no place else to go), or other place not intended as a domicile; and e) having used any type of cigarette, ENDS, or other tobacco product in the past 30 days.

The analyses presented in this paper examine the association between the appeal of ATP-specific advertising materials (e.g., appeal of ENDS advertising) and future intentions to use that ATP (e.g., intentions to use ENDS in the future) only among ever users of the specific ATP in question (e.g., among lifetime ever users of ENDS); never users were not asked the questions about advertising appeal in this study. Thus, the sample sizes and compositions differ for each ATP studied (ENDS, hookah, cigars, LCCs, smokeless tobacco); descriptive information on the samples (i.e., lifetime users of each ATP) is presented in Table 1.

Procedures

A main sample and a supplemental sample that focused on sexual minority youth (i.e., lesbian, gay, bisexual, questioning, or Asexual [LGBQA]) were recruited. For the main sample, 613 youth were approached for eligibility screening; this represented nearly everyone that was available at a site in that specific recruiting block (19 refused, 224 were ineligible, and 370 were eligible). Of the 370 youth that were eligible, 357 completed the survey. Of the 357 completers, three individuals were dropped due to poor quality data; thus, the final sample size for the main sample was 354. For the supplemental sample that focused on LGBQA youth, we recruited from the 10 original sites (of 25) that yielded the highest recruitment of LGBQA participants during the main data collection. This supplemental data collection involved approaching 420 youth for eligibility screening; this also represented nearly everyone that was available at a site in that specific recruiting block (19 refused, 280 screened ineligible, and 121 screened eligible). Of the 121 LGBQA youth that were eligible, 115 completed the survey. After reading the written consent document, having questions and concerns addressed, and providing verbal informed consent, participants completed a self-administered paper-pencil survey, which took approximately 40 minutes to complete. Trained field staff were available to assist participants in completing the survey, if needed. Youth received \$3 for the eligibility screening and \$20 for the survey. This research was approved by RAND's Human Subjects Protection Committee (protocol #2016-0511).

Covariates

The following assessments were administered to participants as part of the survey and used to address the goals of this paper. Descriptive information on their responses (i.e., lifetime users of each ATP) is provided in Table 1.

Demographics—We assessed: Self-reported gender (female/transgender female, male/transgender male); sexual minority identity as lesbian, gay, bisexual, questioning, or asexual (LGBQA, straight/heterosexual); race/ethnicity (non-Hispanic black, Hispanic/Latino, non-Hispanic multiracial/other, non-Hispanic white); age; education (less than high school, more than high school, high school graduate); past month income from all sources; and whether participants had slept outdoors in the past 30 days because of nowhere else to stay (yes/no; as an indicator of homelessness severity).

Tobacco use—Standard items drawn from national surveys (e.g., Monitoring the Future; <http://www.monitoringthefuture.org/>) were used to assess lifetime and past month tobacco use. Separate items assessed lifetime ever use of five ATPs (number of days of lifetime use, 0 to over 100 days, recoded as no [0 days], yes [1 day]): *ENDS* (i.e., electronic, e-cigarettes, or personal vaporizers filled with nicotine e-liquid); *hookah* (i.e., waterpipe to smoke tobacco); *cigars*; *LCCs* (i.e., Little cigars or cigarillos); and *smokeless tobacco* (i.e., chewing tobacco or snuff). Participants that reported any lifetime use of a specific ATP answered a further question about number of days of use of that product during the past month (categorized as: no use, used on some days [1–19 days], used on most days [20–30 days]). Level of past-month use of a product and number of ATPs used in the past month were used as covariates in the analyses.

Advertising covariates—All participants answered the following five questions about whether they had seen specific kinds of tobacco advertising in the past 30 days (no, yes): “Cigarette or other tobacco advertising on the internet?” (yes=43.7%); “Cigarette or other tobacco packages being displayed, including on shelves or on the counter at retail stores?” (yes=68.5%); “Cigarette or other tobacco products being advertised on posters outside or inside of retail stores?” (yes=67.3%); “People smoking cigarettes in movies or on television?” (yes=69.0%); “Advertisements for electronic cigarettes on television?” (yes=49.3%). “Yes” responses to these five items were counted to produce a value that estimated the number of tobacco advertising exposures in the past month (see Table 1). The score for this set of items could range from 0 (indicating no exposure) to 5 (indicating high levels of exposure). Reliability (α) was 0.79.

Participants also answered the following four questions that asked about their receipt and use of coupons or promotions to purchase tobacco products in the past 30 days (no, yes): “Received an e-mail message with promotions or coupons for cigarettes or tobacco products?” (yes=19.8%); “Bought a brand of tobacco product because of a price promotion?” (yes=37.4%); “Bought a brand of tobacco product other than your usual brand because you noticed it displayed in the store or on signs?” (yes=31.3%); and “Used a coupon to buy cigarettes or tobacco products?” (yes=28.8%). Responses to these four items were counted to produce a value that estimated receptivity to price and promotions in the

past month (see Table 1). The score for this set of items could range from 0 (indicating no receptivity to price and promotions) to 4 (high susceptibility to price and promotions). Reliability (α) was 0.77.

All nine of these advertising covariates were drawn or adapted from wave 1 of the PATH adult survey (<https://pathstudyinfo.nih.gov/UI/HomeMobile.aspx>).

Advertising appeal—Participants that reported any lifetime use of a specific ATP, indicated their reasons for using that ATP (“Have you used [ATP] for the following reasons?”). One of the reasons listed was “Advertising for it appeals to me” and responses could be made as either a “no” or a “yes” (see Table 1). This item was also drawn from wave 1 of the PATH adult survey.

Dependent measure: Future use intentions

Conceptually, intentions serve as an important proximal index of risk of future tobacco product use^{41,42} and intentions to use have been associated with use of ENDS,⁴³ hookah,⁴⁴ LCCs and cigars,⁴⁵ and smokeless tobacco.¹⁷ Participants rated their likelihood of using each of the ATPs under investigation (ENDS, hookah, cigars, LCCs, smokeless) in the next six months using the following response options: Definitely No [1]; Probably No [2]; Probably Yes [3]; Definitely Yes [4] (for descriptive information, see Table 1). Higher scores indicated a greater intention to use that specific ATP in the future. These intention items were adapted for ATPs from a previous study, where it was shown to predict cigarette use.⁵¹

Analytic Strategy

Because study participants are not selected with equal probabilities, the use of sampling weights are necessary to correct for the bias induced by the differential inclusion/sampling probabilities. All analyses incorporate these sampling weights and account for the modest design effect that they induce, using the linearization of standard errors. Missing data ranged from 0–4% of cases and was imputed using the mean/mode of all non-missing responses.

Linear regression analyses were performed to test for associations between the appeal of advertising for a specific ATP and intentions to use that ATP in the future, controlling for covariates described above. In all analyses, we restricted the analytic sample to include only lifetime users of the ATP of interest; for example, when predicting intentions to use cigars, only those who reported lifetime use of cigars were included in the model.

Continuous assessments of tobacco use intentions, such as ours, are sometimes transformed into dichotomous variables (definitely no vs all other responses).^{17, 43} As such, in a parallel analysis, we also treated intentions as a dichotomous variable for each of the five ATPs and used logistic regression to analyze the data. The results were unchanged. Therefore, we present only the linear regression analyses using the original scaling of the use intention items.

Results

Of the total sample ($n=469$), most reported at least some lifetime use of ENDS, hookah, cigars, and LCCs, with about one quarter of the total sample reporting lifetime use of smokeless tobacco (Table 1). Several other demographic findings in Table 1 merit reporting. While there was little variation in age between lifetime users of each product, females composed a greater percentage of lifetime users of ENDS and hookah (approximately 30%) compared to cigar and LCC users (approximately 23% for each), and smokeless tobacco users (approximately 15%). A lower percentage of LGBQA youth (about 22%) used smokeless tobacco compared to hookah (where LGBQA use was highest at about 29%). Regardless of lifetime use of a specific product, more than 70% of users had slept outdoors in the past month.

The percentage of lifetime users who reported any past month use of the product was highest for past-month use LCCs (68%), followed by cigars (54%), ENDS (42%), and used hookah and smokeless tobacco (about 25% for each product). On average, lifetime ATP users reported using two to three different tobacco products in the past month. Advertising appeal (i.e., advertising appeal being affirmatively listed as a reason for product use) was highest for hookah (38%), followed by ENDS (28%), and cigars (25%); with LCCs and smokeless tobacco having the lowest level of advertising appeal (about 16%).

Tables 2–6 present the results of linear regression analyses predicting future use intentions to use each product from the covariates listed in Table 1 and advertising appeal for lifetime users of the product. Advertising appeal was significantly associated with future intentions to use ENDS (Table 2) and hookah (Table 3). These relationships were found even after controlling for level of current ATP use (i.e., number of ATPs used in the past month), level of tobacco advertising exposure in the past month, and several key demographic variables (e.g., gender, sexual and gender minority identity, race and ethnicity, and age).

Advertising appeal was not associated with use intentions for cigars (Table 4), LCCs (Table 5), or smokeless tobacco (Table 6).

Although not a focus of this study, it is interesting to note the covariates that were associated with future intentions to use ATPs. For example, race/ethnicity was relevant, with black and Hispanic/Latino youth reporting weaker future intentions to use ENDS and LCCs compared to whites. Heavier use of ENDS, hookah, cigars, and LCCs in the past month was associated with stronger use intentions for each of these ATPs in turn. Other covariates that were uniquely associated with future use intentions for a single ATP included: older age, which was associated with weaker future use intentions for ENDS only; being female, which was associated with stronger use intentions for hookah only; and identifying as LGBQA, which was associated with stronger use intentions for LCCs only.

Discussion

This study examined the association between the appeal of tobacco advertising and future use intentions for five ATPs: ENDS (e-cigarettes and vaping products), hookah, cigars, LCCs (little cigars/cigarillos), and smokeless tobacco. The population was young tobacco

users experiencing homelessness who had some experience with tobacco in the past. This population that has very high rates of both cigarette smoking and ATP use^{3,4} and predictors of ATP use in this at-risk population are not well studied. It was important to examine advertising appeal for each ATP separately because advertisements for each often emphasize different themes or messages.^{25, 26}

A key finding from this study is that the potential impact of advertising on future intentions to use tobacco products among young people experiencing homelessness differs by product type. Specifically, in previous lifetime users of ENDS and hookah, the appeal of advertising for those products was significantly associated with intentions to use those products again in the future; however, the appeal of advertising for cigars, LCCs, and smokeless tobacco was not. While we do not know details of participants' exposure to advertising – such as which advertisements for which ATPs they saw, or through which delivery channels they were exposed (e.g., ENDS in magazines; hookah on social media) – there are themes common to advertising for both ENDS and hookah that seem to be important to this population (i.e., participants found advertising for these two products most appealing). For example, common themes in ENDS and hookah advertising include messaging regarding harm reduction and that the product is a healthier alternative to cigarette smoking.^{27, 31} The appealing flavor and taste of these products are also thematically relevant.^{30,31} Perceptions of ENDS and hookah as being less harmful^{52, 53} and as having a more palatable taste^{54, 55} are not only associated with use in the young adult population in general, but qualitative work has found that these are cited as reasons for using these products by young tobacco users experiencing homelessness.⁵⁶ Taken together, these findings suggest that perceptions and beliefs about ENDS and hookah are, in part, derived from exposure to advertising with themes that emphasize flavor and/or harm reduction. Or alternatively, that homeless youth who intend to use ENDS and/or hookah in the future believe that these products are less harmful and/or have palatable flavors and seek out advertising for these products that is appealing. Future research with young tobacco users experiencing homelessness is needed to tease out the causal direction of these relationships. In general, our results add to the growing body of research that has highlighted the importance of advertising and marketing to ENDS and hookah use.^{13–14, 32,57}

Future intentions to use cigars, LCCs, and smokeless tobacco were not related to the appeal of advertisements for these products. Advertising for these three products was also seen as less appealing compared to ENDS and hookah. Although flavor is often emphasized as a theme with LCCs and sometimes with smokeless tobacco,^{29, 35} other aspects of the advertising for these products (e.g., “party” lifestyle for LCCs; masculine themes for smokeless tobacco)^{27, 33, 36} may have rendered their appeal unimportant in relating to future intentions in this population. It is also possible that themes regarding flavor need to be paired with harm reduction messages (i.e., as with ENDS, and hookah) for appeal to be associated with future use intentions for these products.

Although not a focus of this study, some of the other covariates that emerged as significant predictors of future use intentions in our study have not been found in studies of non-homeless young adults. For example, a study of young adult cigarette smokers⁵⁸ found that black and Hispanic young adults had weaker openness to using ENDS, snus, and chewing

tobacco whereas our study found these ethnic/race differences between ENDS and LCCs only. This same study of young adult cigarette smokers also found that compared to males, females were less open to trying ENDS, pipes, snus, and chewing tobacco (with no gender differences for hookah), whereas we found that females had stronger intentions for future hookah use compared to males (with no gender differences for other tobacco products). While there could be many reasons for differences to have emerged between studies of homeless versus non-homeless youth (e.g., mix of covariates included; use of different measures of the same constructs), these results highlight the importance of not making assumptions that results from non-homeless samples necessarily generalize to those experiencing homelessness. Understanding more about how the correlates of tobacco use may differ for young people experiencing homelessness is critical to informing efforts to reduce tobacco use in this underserved population.

Strengths of this study include its focus on a population that has been virtually ignored in efforts to reduce youth tobacco use, the relatively large probability sample, the examination of multiple classes of tobacco products, and the range of covariates that were accounted for in examining the association between tobacco advertising appeal and intentions to use. However, several limitations of this study need to be mentioned. First, the design was cross sectional. Although we controlled for typical covariates in predicting future tobacco use intentions in all analyses, this design limits the strength of any causal inferences. Second, our other advertising covariates (price promotions and number of advertising exposures) were assessed at a general tobacco rather than a product-specific level (we did not collect data on ATP-specific price promotions or advertising exposures); and advertising appeal is only one feature of advertising that contributes to its persuasive efficacy. Product-specific estimates of exposure and price promotions, and other features of advertising (e.g., amount of text; model attractiveness; channel for exposure) could have changed the results. Third, there are other variables that were not examined in this study, such as social pressure⁵⁹, which could have influenced intentions to use. Fourth, the sample was selected from service sites and street venues in Los Angeles County; the results may not generalize to youth experiencing homelessness in other areas of the country or to older homeless adults. Finally, it is important to note that our sample was limited to previous users of a given ATP; we are not able to examine how appeal relates to initiation intentions, but rather focused on how appeal relates to continued use intentions.

In conclusion, this was the first study to examine the role of specific advertising features to future intentions to use different tobacco products in homeless youth; our results demonstrate that the appeal of advertising for ENDS and hookah contribute to homeless youths' future risk of use of those products; these same relationships were not found for cigars, LCCs, or smokeless tobacco products. Future research should examine these relationships in more detail, as well as assess relationships between intentions to use and actual use. Policies and regulations should consider actions that have the potential to have an impact on this population of vulnerable, at risk tobacco users specifically. These could include: limiting the influence of tobacco advertising through restrictions at point-of-sale locations or in print (this would potentially affect the general population as well); enacting tobacco-free policies and cessation programs at drop-in centers and health clinics serving

homeless youth; and implementing health education campaigns that emphasize the harms of ATP product use.⁶⁰

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So What?

What is already known on this topic?

Rates of use of alternative tobacco products (ATPs) in young people experiencing homelessness are much higher than in the general population. Predictors of ATP use are understudied, particularly the role of advertising, a known predictor of use in non-homeless ATP users.

What does this article add?

This study adds information about youth who are experiencing homelessness and advertising of tobacco products. In particular, a first look is provided for how an important feature of tobacco advertising, the appeal of the advertising, was associated with future use intentions of a range of ATPs (electronic cigarettes/vaping products, hookah, cigars, cigarillos, smokeless tobacco).

What are the implications for health promotion practice or research?

Policies and regulations should consider limiting the influence of tobacco advertising for this population of vulnerable, at risk group of tobacco users. For example, health education campaigns at shelters, drop-in centers, and health clinics serving homeless youth and limiting advertising at known hang-outs for homeless youth may be warranted. Educating homeless youth about the harms associated with ATP use is also warranted.

Table 1.

Descriptive statistics for lifetime users of each ATP.

	ENDS <i>n</i> = 292	Hookah <i>n</i> = 250	Cigar <i>n</i> = 271	LCC <i>n</i> = 297	Smokeless <i>n</i> = 120
% Female/transgender female	30.01	31.06	23.35	23.16	15.26
% LGBQA	28.60	29.01	25.20	25.44	21.46
Race/ethnicity					
% Black, non-Hispanic	26.39	28.09	27.80	29.82	15.18
% Hispanic/Latino	23.62	21.84	22.44	20.53	28.19
% Multiracial/other, non-Hispanic	16.65	17.55	16.88	16.22	16.46
% White, non-Hispanic	33.33	32.53	32.78	33.44	40.17
% Slept outdoors, past month	76.47	75.03	73.67	71.78	79.50
Mean (<i>SD</i>) Age	21.89 (2.24)	22.25 (2.06)	21.91 (2.35)	21.90 (2.20)	21.95 (2.46)
Education					
% Less than high school	31.15	26.15	29.50	29.44	24.73
% High school graduate or GED	40.02	45.15	46.82	48.59	56.84
% More than high school	28.83	28.70	23.58	21.98	18.43
Mean (<i>SD</i>) monthly income (in whole dollars)	273.26 (322.62)	249.64 (289.81)	259.48 (313.53)	252.16 (300.16)	209.68 (263.93)
Mean (<i>SD</i>) no. current ATPs used	2.594 (2.01)	2.605 (1.99)	2.81 (1.91)	2.78 (1.86)	3.21 (2.24)
Mean (<i>SD</i>) receptivity to price and promotions, past month	1.385 (1.47)	1.362 (1.45)	1.267 (1.30)	1.33 (1.41)	1.21 (1.45)
Mean (<i>SD</i>) ad exposures, past month	3.290 (1.66)	3.216 (1.74)	3.00 (1.73)	3.14 (1.60)	3.01 (1.73)
ATP use, past month					
% used on most days	8.26	4.65	19.47	27.08	5.60
% used on some days	33.60	20.05	34.72	41.39	20.59
% no use	58.14	75.30	45.81	31.53	73.72
% ATP ad appeal	27.77	38.09	24.75	15.93	16.25
Mean (<i>SD</i>) future use intentions	2.18 (1.10)	2.00 (1.07)	2.41 (1.15)	2.55 (1.12)	1.78 (1.00)

Table 2.

Results of linear regression predicting intentions to use ENDS from covariates and ENDS advertising appeal ($n = 292$).

Variable	Estimate	S.E.	<i>t</i>	<i>P</i>
Intercept	3.25	0.67	4.87	<.01
Participant characteristics				
Gender				
Female/transgender female	-0.09	0.14	-0.62	0.54
Male/transgender male (ref.)	--	--	--	--
Sexual minority identity				
LGBQA	-0.02	0.15	-0.16	0.87
Straight/heterosexual (ref.)	--	--	--	--
Race/Ethnicity				
Black, non-Hispanic	-0.42	0.15	-2.77	<0.01
Hispanic/Latino	-0.41	0.16	-2.61	0.01
Multiracial/other, non-Hispanic	-0.27	0.18	-1.52	0.13
White, non-Hispanic (ref.)	--	--	--	--
Age	-0.08	0.03	-2.94	<0.01
Education				
Less than high school	0.19	0.15	1.24	0.21
More than high school	0.23	0.15	1.54	0.13
High school graduate (ref.)	--	--	--	--
Slept outdoors, past 30 days				
Yes	0.25	0.15	1.71	0.09
No (ref.)	--	--	--	--
Total income, past month	0.02	0.02	0.88	0.38
Tobacco use				
Number current ATPs used	0.13	0.04	3.27	<0.01
ENDS use, past month				
used on most days	0.70	0.26	2.73	<0.01
used on some days	0.19	0.17	1.13	0.26
no use (ref.)	--	--	--	--
Advertising exposure and appeal				
Receptivity to price and promotions, past month	-0.07	0.05	-1.49	0.14
Ad exposures, past month	0.04	0.04	0.99	0.33
ENDS ad appeal				
Yes	0.38	0.14	2.80	<0.01
No (ref.)	--	--	--	--

Table 3.

Results of multivariable linear regression predicting intentions to use Hookah from covariates and Hookah advertising appeal ($n = 250$).

Variable	Estimate	S.E.	<i>t</i>	<i>p</i>
Intercept	0.79	0.76	1.04	0.30
Participant characteristics				
Gender				
Female/transgender female	0.31	0.15	2.11	0.04
Male/transgender male (ref.)	--	--	--	--
Sexual minority identity				
LGBQA	-0.12	0.15	-0.81	0.42
Straight/heterosexual (ref.)	--	--	--	--
Race/Ethnicity				
Black, non-Hispanic	-0.15	0.16	-0.96	0.34
Hispanic/Latino	-0.13	0.16	-0.77	0.44
Multiracial/other, non-Hispanic	-0.34	0.18	-1.92	0.06
White, non-Hispanic (ref.)	--	--	--	--
Age	0.03	0.03	0.82	0.42
Education				
Less than high school	-0.09	0.15	-0.59	0.56
More than high school	0.12	0.15	0.78	0.44
High school graduate (ref.)	--	--	--	--
Slept outdoors, past 30 days				
Yes	-0.06	0.15	-0.41	0.69
No (ref.)	--	--	--	--
Total income, past month	0.01	0.02	0.22	0.83
Tobacco use				
Number current ATPs used	0.09	0.04	2.28	0.02
Hookah use, past month				
used on most days	0.94	0.33	2.85	<0.01
used on some days	0.84	0.18	4.60	<.01
no use (ref.)	--	--	--	--
Advertising exposure and appeal				
Receptivity to price and promotions, past month	0.01	0.05	0.09	0.93
Ad exposures, past month	0.03	0.04	0.83	0.41
Hookah ad appeal				
Yes	0.43	0.13	3.41	<0.01
No (ref.)	--	--	--	--

Table 4.

Results of multivariable linear regression predicting intentions to use cigars from covariates and cigar advertising appeal ($n = 271$).

Variable	Estimate	S.E.	<i>t</i>	<i>P</i>
Intercept	1.58	0.61	2.59	0.01
Participant characteristics				
Gender				
Female/transgender female	-0.13	0.17	-0.76	0.45
Male/transgender male (ref.)	--	--	--	--
Sexual minority identity				
LGBQA	-0.09	0.16	-0.55	0.58
Straight/heterosexual (ref.)	--	--	--	--
Race/Ethnicity				
Black, non-Hispanic	-0.06	0.16	-0.36	0.72
Hispanic/Latino	-0.12	0.16	-0.74	0.46
Multiracial/other, non-Hispanic	-0.23	0.18	-1.31	0.19
White, non-Hispanic (ref.)	--	--	--	--
Age	-0.01	0.03	-0.24	0.81
Education				
Less than high school	0.12	0.15	0.81	0.42
More than high school	0.06	0.15	0.38	0.70
High school graduate (ref.)	--	--	--	--
Slept outdoors, past 30 days				
Yes	0.21	0.14	1.50	0.14
No (ref.)	--	--	--	--
Total income, past month	0.01	0.02	0.07	0.95
Tobacco use				
Number current ATPs used	0.03	0.04	0.63	0.53
Cigar use, past month				
used on most days	1.50	0.18	8.17	<.01
used on some days	0.92	0.16	5.72	<.01
no use (ref.)	--	--	--	--
Advertising exposure and appeal				
Receptivity to price and promotions, past month	0.08	0.05	1.63	0.11
Ad exposures, past month	0.03	0.04	0.67	0.50
Cigar ad appeal				
Yes	0.10	0.14	0.70	0.49
No (ref.)	--	--	--	--

Table 5.

Results of multivariable linear regression predicting intentions to use LCCs from covariates and LCC advertising appeal ($n = 297$).

Variable	Estimate	S.E.	<i>t</i>	<i>p</i>
Intercept	1.66	0.60	2.76	<0.01
Participant characteristics				
Gender				
Female/transgender female	-0.22	0.16	-1.41	0.16
Male/transgender male (ref.)	--	--	--	--
Sexual minority identity				
LGBQA	0.50	0.15	3.31	<0.01
Straight/heterosexual (ref.)	--	--	--	--
Race/Ethnicity				
Black, non-Hispanic	-0.51	0.15	-3.43	<0.01
Hispanic/Latino	-0.34	0.16	-2.04	0.04
Multiracial/other, non-Hispanic	-0.03	0.18	-0.14	0.89
White, non-Hispanic (ref.)	--	--	--	--
Age	0.01	0.03	0.53	0.60
Education				
Less than high school	-0.04	0.14	-0.31	0.75
More than high school	-0.47	0.15	-3.06	<0.01
High school graduate (ref.)	--	--	--	--
Slept outdoors, past 30 days				
Yes	-0.06	0.14	-0.44	0.66
No (ref.)	--	--	--	--
Total income, past month	0.03	0.02	1.48	0.14
Tobacco use				
Number current ATPs used	0.02	0.04	0.56	0.58
LCC use, past month				
used on most days	1.02	0.17	5.85	<.01
used on some days	0.82	0.15	5.39	<.01
no use (ref.)	--	--	--	--
Advertising exposure and appeal				
Receptivity to price and promotions, past month	0.12	0.05	2.40	0.02
Ad exposures, past month	-0.02	0.04	-0.37	0.71
LCC ad appeal				
Yes	0.27	0.18	1.54	0.13
No (ref.)	--	--	--	--

Table 6.

Results of multivariable linear regression predicting intentions to use smokeless tobacco from covariates and smokeless tobacco advertising appeal ($n = 120$).

Variable	Estimate	S.E.	<i>t</i>	<i>p</i>
Intercept	2.58	0.84	3.08	<0.01
Participant characteristics				
Gender				
Female/transgender female	-0.32	0.25	-1.25	0.21
Male/transgender male (ref.)	--	--	--	--
Sexual minority identity				
LGBQA	0.03	0.21	0.12	0.91
Straight/heterosexual (ref.)	--	--	--	--
Race/Ethnicity				
Black, non-Hispanic	-0.06	0.24	-0.26	0.80
Hispanic/Latino	-0.17	0.21	-0.84	0.41
Multiracial/other, non-Hispanic	0.22	0.22	0.98	0.33
White, non-Hispanic (ref.)	--	--	--	--
Age	-0.04	0.04	-1.21	0.23
Education				
Less than high school	0.14	0.20	0.73	0.47
More than high school	0.10	0.22	0.43	0.67
High school graduate (ref.)	--	--	--	--
Slept outdoors, past 30 days				
Yes	-0.07	0.22	-0.31	0.76
No (ref.)	--	--	--	--
Total income, past month	-0.04	0.03	-1.08	0.28
Tobacco use				
Number current ATPs used	0.15	0.05	3.00	<0.01
Smokeless use, past month				
used on most days	0.32	0.46	0.70	0.49
used on some days	0.30	0.25	1.19	0.24
no use (ref.)	--	--	--	--
Advertising exposure and appeal				
Receptivity to price and promotions, past month	0.09	0.08	1.17	0.24
Ad exposures, past month	-0.16	0.06	-2.66	<0.01
Smokeless ad appeal				
Yes	0.43	0.27	1.62	0.11
No (ref.)	--	--	--	--