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# Polytobacco Use Among College Students

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### **Polytobacco Use Among College Students**

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## ABSTRACT

### Introduction

Use of more than one tobacco product among college students is increasing in popularity, leading to nicotine addiction and additional health risks. The study 1) examined polytobacco use patterns among college students who had ever used tobacco; and 2) assessed the sociodemographic and personal factors associated with current polytobacco use, compared to current single product use and former tobacco use among college students.

### Methods

Of 10,000 randomly selected college students from a large public university in the Southeast, a sample of 1,593 students age 18 or older completed an online survey assessing tobacco use and attitudes. Ever tobacco users were included in this study ( $n = 662$ , or 41.6% of survey completers).

### Results

About 15% of ever users reported current polytobacco use, and more than 70% of polytobacco users smoked cigars, little cigars, or clove cigarettes in combination with one or more products. Cigarettes were the most commonly-used product among single users, followed by hookah. Males, underclassmen, and students with greater acceptance of cigarette use were more likely to be polytobacco users. Race/ethnicity was marginally related to polyuse status, with White/non-Hispanics 28% less likely to be polytobacco users versus single product users.

### Conclusions

Polytobacco users were more likely than single users to consume emerging tobacco products, (i.e., hookah and e-cigarettes). Males, underclassmen, and racial/ethnic minorities were more at risk for polytobacco use. As young people are particularly prone to nicotine addiction, there is a need to further investigate polytobacco use among college students.

## INTRODUCTION

Polytobacco use is increasing in popularity,<sup>1,2</sup> particularly as new forms of tobacco products are emerging.<sup>3</sup> Polytobacco use is the concurrent use of cigarettes and other tobacco products such as electronic cigarettes (e-cigarettes), smokeless tobacco, waterpipe (hookah) and cigars, or more simply stated, the use of more than one tobacco product at a time. The CDC reports that the use of cigarettes with any other form of tobacco is highest among certain subgroups, such as those between the ages of 18-24.<sup>4</sup> College students predominantly fall into this age group, and often exhibit high levels of substance use<sup>5</sup> and progression to regular tobacco use.<sup>6</sup> Approximately 14.1% of college students are current cigarette smokers and 16.1% have smoked cigarettes in their lifetime.<sup>7</sup> Little is known about the full extent of tobacco use among college students,<sup>8</sup> especially as the use of new non-combustible tobacco products gain popularity.<sup>7</sup> Given the tendency for college students to be drawn to emerging tobacco products (i.e., hookah, e-cigarettes),<sup>9</sup> research is warranted.

College-aged young adults are at increased risk for using non-cigarette tobacco products including cigars, cigarillos, smokeless tobacco, hookah<sup>7,10-13</sup> and e-cigarettes.<sup>14-16</sup> Consequently, young adults aged 18-24 are more likely to report polytobacco use than adults 25 years or older,<sup>2,17</sup> with rates varying from 30%<sup>18</sup> to 45%.<sup>2</sup> A Canadian study reported a slightly lower prevalence of lifetime polytobacco use among young adults ages 20-24 at 26.2%.<sup>19</sup>

Whereas past research has focused mainly on cigarette use with its inherent health risks and societal costs, the introduction of new, emerging tobacco products has created a need to examine polytobacco use. Unfortunately, research is limited in this area. However, a nationally representative survey of college students in 2000 indicated that 51.3% of tobacco-using American college students used more than one product.<sup>8</sup> At that time, however, fewer products were available, not accurately reflecting current polytobacco use patterns. Latimer, Batanova,

and Louka<sup>20</sup> found that 10.3% of college students were polytobacco users, with hookah use most common. Others reported that 9.3% of undergraduates reported dual use of cigarettes and hookah.<sup>21</sup> Current hookah use is associated with daily and nondaily cigarette smoking<sup>22</sup> while lifetime use is associated with heavy cigarette smoking and problem tobacco use.<sup>23</sup> E-cigarette use is also associated with conventional cigarette smoking.<sup>24</sup> Young men who use smokeless tobacco are also more likely to smoke cigarettes than those who do not use smokeless.<sup>25</sup> The results of these studies are concerning when one considers the potential individual and public health outcomes.

Polytobacco use is associated with increased physical and psychological health risks compared to single tobacco product use. Polytobacco users report more dependence symptoms than those who smoke cigarettes or use smokeless tobacco alone.<sup>26</sup> In addition, polytobacco use increases nicotine exposure and risk for dependence,<sup>20</sup> which may in turn increase risk of tobacco-related disease or death compared to single product use. This is especially important for population health and policy regulations. Polytobacco users typically have a more difficult quitting<sup>27,28</sup> and tobacco dependence treatment programs have historically been focused on cigarette smoking cessation, and not toward the newer emerging tobacco products. Currently there are few regulations associated with the marketing, sale, and use of emerging tobacco products even though the Food and Drug Administration (FDA) has tobacco regulatory authority under the 2009 Tobacco Control Act.<sup>29</sup> As a result, these emerging products are more easily available and are heavily promoted and marketed,<sup>30</sup> perhaps, contributing to polytobacco use.

Research is needed to identify those at risk and patterns of polytobacco use in order to plan and test targeted interventions and guide product regulation. This study examined: 1) polytobacco use patterns among college students who had ever used tobacco; and 2)

sociodemographic and personal factors associated with current polytobacco use, compared to current single tobacco product use and former tobacco use among college students.

## METHODS

The analysis reported here was part of a larger study to evaluate the impact of the CDC Tips<sup>31</sup> television campaign conducted at a large public university in the Southeastern U.S. Two randomly-selected cohorts of students were surveyed two months apart. The analysis is based on the combined sample of those who had ever used one of five tobacco products (i.e., cigarettes, e-cigarettes, hookah, smokeless tobacco, and the combined category of cigars, little cigars and clove cigarettes). Approval for the study was obtained from the university's Institutional Review Board.

### Participants

Two cohorts of randomly-selected students (5,000 each), all aged 18 or older, were provided by the University Registrar. Each was representative (in terms of gender and academic status) of the population of 26,139 students enrolled in Spring 2013; pre-professional (e.g., medicine, nursing, dentistry, pharmacy, physical therapy, etc.) students were not included in the sample. The two separate samples were sent surveys in February and April 2013, respectively. The combined sample of 10,000 randomly-selected students who were sent surveys included 4,134 female undergraduates; 1,065 female graduate students; 3,968 male undergraduates; and 833 male graduate students. These samples reflected the ratio of undergraduates (81%) to graduate students (19%), as well as the percentage of females (52%) to males (48%) in the university population of eligible students. With combined cohorts, a total of 1,593 students responded to the survey (15.9% overall response rate). Only those who had ever used tobacco were included in this analysis ( $n = 662$ ; 41.6% of survey completers). Of the remaining 931

participants, 847 were not included because they had never used any of the five forms of tobacco, and an additional 84 were omitted due to incomplete tobacco use history.

## **Procedures**

Students were invited via their university email to participate in an online survey through Qualtrics software,<sup>32</sup> which assigned potential participants a unique code to protect confidentiality. Reminder emails from survey codes not returned were sent a follow-up email one and two weeks after the initial email. Those who did not return the survey after three weeks were considered non-responders and further follow-up was not attempted. All survey completers were provided a separate link to enter a drawing to win a \$25 gift card.

## **Measures**

### *Tobacco use*

Tobacco use related to conventional cigarettes, e-cigarettes, hookah, smokeless tobacco, and the combined category of cigars, little cigars and clove cigarettes was assessed using a series of questions.<sup>7</sup> Current and former cigarette use was determined by assessing whether respondents had smoked at least 100 cigarettes and how recently they had used them. Among those who met the 100-cigarette threshold, current smokers had used in the last 30 days and former smokers used less recently. Current and former use of the four emerging products was assessed by asking: 'Within the last 30 days, on how many days did you use:' 'never,' 'have used, but not in the last 30 days,' '1-2 days,' '3-5 days,' '6-9 days,' '10-19,' '20-29,' and 'used daily.' Based on responses to these questions, participants were categorized as former, single, or polytobacco product users. Former users had not used any tobacco product in the past 30 days, but had used at least one of the five products prior to that time. Current single tobacco users had used exactly one of the five tobacco products in the past 30 days, though they may have used others previously. For example, a former cigarette smoker (who most recently smoked more than a

month ago) currently using only hookah would be defined as a single tobacco product user. Current polytobacco users had used at least two of the five products in the last 30 days, regardless of type or number.

### *Sociodemographic and personal variables*

Three questions comprised the cigarette social norms subscale including acceptance of peer smoking and personal beliefs about smoking.<sup>33</sup> Five-point Likert items included, “How would your best friend react if you smoked cigarettes?” (‘very upset,’ ‘somewhat upset,’ ‘no opinion,’ ‘somewhat approving,’ ‘very approving’); “People who are important to me think I should not smoke cigarettes” (‘strongly agree’ to ‘strongly disagree’); and “It is OK for someone like you to smoke cigarettes” (‘strongly agree’ to ‘strongly disagree’). The three items were summed to form the total score, ranging from 3-15; higher scores indicated greater perceived acceptance of cigarette smoking. Cronbach’s alpha was 0.62. Age, gender, race/ethnicity, academic level (i.e., lower undergraduate, upper undergraduate, graduate student), type of residence (on- or off-campus), and involvement in a Greek organization were assessed.

### **Data Analysis**

Descriptive statistics were used to summarize study variables. One-way analysis of variance assessed differences in cigarette social norms among the three tobacco use groups; post hoc pairwise testing was accomplished with Fisher’s least significant difference procedure. Prevalence of use was calculated for each tobacco product among single and polytobacco users.

To evaluate overall model fit of the multinomial regression, Hosmer-Lemeshow goodness-of-fit tests were used for each binary comparison (polytobacco vs. former use; polytobacco vs. single use), as suggested by Hosmer and Lemeshow.<sup>34</sup> Variance inflation factors assessed for multicollinearity. All analyses were conducted using SAS v. 9.3; an alpha level of .05 was used throughout

Multivariate multinomial logistic regression was used to evaluate sociodemographic and personal characteristics associated with tobacco use group membership (former, single, and polytobacco users). Potential predictors included age, gender, race, academic status, residence, member of fraternity/sorority, cohort, and cigarette social norms. The model simultaneously tested for predictors of former and single tobacco use relative to the reference category of polytobacco use. The multinomial regression model yielded two series of estimates: former users vs. polytobacco users, and single tobacco product users vs. polytobacco users. To identify possible risk factors for polytobacco use relative to single and former use, corresponding odds ratios (OR) from the multinomial model were inverted to reflect group comparisons of interest: polytobacco users vs. former users, and polytobacco users vs. single tobacco product users, each with accompanying 95% confidence intervals.

## RESULTS

Mean age of the 662 study participants was 22.4 years ( $SD=6.1$ ; Table 1). Most participants were female, and over three-quarters were White, non-Hispanic. Approximately half were lower level undergraduates (freshman or sophomore). Fewer than one-third lived on-campus, and one in five students were in a fraternity/sorority. The combined sample included slightly more participants from the February cohort (54%). Compared to the full cohort of students who were sent surveys, this sample included an over-representation of both females (52% vs. 65%, respectively) and graduate students (19% vs. 27%, respectively), but it is unknown how these characteristics compared to the demographics of the population of current and former tobacco users at the university.

Among respondents using exactly one of the five tobacco products (i.e., 'single' users), the most commonly used product was conventional cigarettes (37%), followed by hookah (33%)

and cigars, little cigars, or clove cigarettes (20%; Figure 1). Less than 10% of students in the single tobacco product user group currently used smokeless tobacco or e-cigarettes as their sole tobacco product. Over half of the ever-using students were former tobacco users.

The frequency of use for each of the five products among polytobacco users are also shown in Figure 1. Since everyone in this group of participants used at least two of these products, the sum of percentages across the five products exceeds 100. The most commonly used product among polytobacco users was the combined category of cigars, little cigars, or clove cigarettes (Figure 1) and almost three-quarters used them in combination with one or more other tobacco products. The second most commonly used combination product was conventional cigarettes; over 60% of polytobacco users smoked conventional cigarettes. Nearly half of the polytobacco group used hookah in combination with one or more other tobacco product(s). Smokeless tobacco and e-cigarettes were the least commonly used by polytobacco users.

Among polytobacco users, nearly two-thirds used two products (64%). Nearly one-fourth of polytobacco users used three products in the last 30 days (23%), while fewer indicated using four (11%) or five products (2%) during this time period. For the 60 polytobacco users who indicated they had used exactly two products, the most frequent pairing was cigarettes with cigars, little cigars, or clove cigarettes (25%). Among the 22 polytobacco users who indicated they had used exactly three products in the past month, the most common combination was cigarettes and hookah with cigars, little cigars or clove cigarettes (41%). For the 10 tobacco users who used exactly four products, the only product indicated by all 10 was the combined category of cigars, little cigars and clove cigarettes. There were also two participants in this polytobacco group who indicated they had used all five products in the last month.

The average cigarette social norms score was 6.07 ( $SD=2.31$ ; range 2-13). There was a significant difference among the three tobacco use groups ( $F=60.1, p<.0001$ ): former tobacco users had the lowest average score ( $M=5.35; SD=2.02$ ), followed by single tobacco users ( $M=6.54; SD=2.25$ ), and polytobacco users ( $M=7.89; SD=2.26$ ). All three groups differed from each other on cigarette social norms ( $p<.0001$ ).

The overall multinomial model was significant ( $\chi^2=142.0; p<.001$ ; Table 2). Gender, academic status, and cigarette social norms were significant predictors of tobacco use group. Males were at 63% higher risk of polytobacco use compared to single use and 53% more likely to be polytobacco users than former users. Relative to graduate students, freshmen and sophomores were at 76% greater risk of polytobacco use compared to single use and 84% more likely to be polytobacco users than former users. Juniors and seniors were 38% less likely to be polytobacco users compared to single tobacco product users. For every 1-unit increase in cigarette social norms, the likelihood of being a polytobacco user relative to a single tobacco product user increased by 26%; odds of polytobacco use relative to a former use increased by 64%. Tobacco user group was not related to race/ethnicity, residence, Greek status, or cohort. Academic status, not age, was used in the multivariate analysis to avoid parameter distortion due to multicollinearity. Both Hosmer-Lemeshow goodness-of-fits tests for the binary logistic models were not significant ( $p=.30$  and  $p=.29$ , respectively), suggesting the overall multinomial model fit the data well. All variance inflation factors were less than 1.6, indicating multicollinearity did not influence the model.

## DISCUSSION

Nearly 15% of college students were current polytobacco users, lower than an estimated 30% dual use rate among young adult tobacco users.<sup>18</sup> Over a third of polytobacco users reported use of three or more tobacco products. This is consistent with previous findings that most college

students who use tobacco consume more than one product.<sup>8</sup> It is concerning that polytobacco use is increasing in popularity.<sup>1,2,35</sup> In our study, polytobacco users were more likely than single tobacco users to consume emerging tobacco products, namely hookah and e-cigarettes. These young polytobacco users are particularly prone to nicotine addiction, resulting in subsequent negative health risks,<sup>28</sup> prompting the need to identify those most at risk and design effective interventions.

While each of the five tobacco products had been used by at least one-quarter of the polytobacco user group in the last month, the most frequently used products were the combined category of cigars, little cigars or clove cigarettes and conventional cigarettes, followed by hookah, smokeless tobacco and e-cigarettes. Although research is limited in this area, our findings are similar to other studies in that use of these products is common in college students who are polytobacco users.<sup>18,20,21</sup> Nearly three-fourths of polytobacco users used cigars, little cigars or clove cigarettes, but relatively few single tobacco product users reported using them. However, hookah and conventional cigarettes were used by at least one-third of both user groups.

E-cigarettes have been available in the U.S. since at least 2006<sup>36</sup> and are gaining popularity among young adults.<sup>37</sup> While the rate of e-cigarette use was fairly low in our sample, e-cigarettes were just beginning to gain popularity in the Southeast during this time period. A large study of college students reported current use of e-cigarettes at 1.5% in the past 30 days, however, this study did not differentiate between single product and polytobacco users.<sup>24</sup> Interestingly, the prevalence of both smokeless tobacco and e-cigarettes was higher in the polytobacco user group than in the single tobacco user group. It is possible that smokeless tobacco and e-cigarettes are promoted and viewed as products to be used in addition to cigarettes

or when conventional smoking is not allowed, and not as a replacement for cigarettes. E-cigarette manufacturers are using aggressive marketing messages similar to those used by the tobacco industry to promote cigarette smoking in the 1950s and 1960s (e.g., product placement in movies).<sup>30</sup> Advertising occurs in venues where cigarette advertising has been prohibited.<sup>30</sup> Population health implications are that promotion and use of these products may contribute to tobacco dependence by providing a nicotine delivery system that can be used when and where smoking is prohibited. In addition, these products may be more easily obtainable by young people as they are not presently regulated by the FDA, which may contribute to a new generation of tobacco users using one or more products at a young age.

Males were more likely to be polytobacco users, as were lower level undergraduates, while upper class undergraduates, graduate students and females were more likely to be single tobacco users. Similarly, Rigotti et al.<sup>8</sup> found that college men are more likely to smoke and also use another tobacco product than women. More recent evidence related to demographics of college student polytobacco users is limited. In a study examining the combined use of cigarettes and smokeless tobacco by college students, men were more likely than women to use these two products.<sup>38</sup> While tobacco use seemed to increase with progression from freshman to junior years, dual use was less prevalent among seniors compared to all other classes. Dual users also reported smoking initiation at significantly younger ages than either sole cigarette smokers or sole smokeless tobacco users. Our findings are consistent with the literature in terms of gender,<sup>8,38</sup> and partially consistent in terms of decreasing polytobacco use from freshman to senior years of college.<sup>38</sup> It is possible that our results were influenced by various use trajectories, such as experimentation with emerging products or as a substitute for cigarette smoking. However, it is unlikely that participants were using emerging products as a substitute

since e-cigarette use was so low in the entire group of former and current tobacco users. There is a critical need to further understand sociodemographic factors, such gender, age, academic class, residence on- or off-campus, membership in a fraternity/sorority, and ethnicity impacting polytobacco use among college student sub-groups.

Polytobacco users were more likely to report a greater acceptance of cigarette smoking. Similarly, Miller et al. found that dual users of cigarettes and smokeless tobacco viewed cigarette smoking as more socially acceptable than single tobacco product users.<sup>38</sup> There are alarming future health implications as social acceptability supports continued smoking<sup>39</sup> and polytobacco use, increasing the risk of associated health consequences.<sup>28,35</sup> Polytobacco use is associated with higher nicotine addiction, greater difficulty quitting tobacco and increased incidence of smoking-related cancers compared to cigarette smoking alone.<sup>27,28,40,41</sup> College students reporting dual use (only two products) in one study were more likely than single tobacco product users to perceive themselves as regular tobacco users, but also had greater confidence in their ability to quit than single tobacco product users and were more likely to have received assistance from a health care provider in their most recent quit attempt.<sup>38</sup> There is a need for tobacco treatment strategies on college campuses directed at both single product tobacco users and polytobacco users. More research is needed on the ability of polytobacco users to quit and the best ways to motivate these subgroups of college students to participate in tobacco treatment and achieve abstinence.

We found an association between race and likelihood of being a polytobacco user, but only when comparing single tobacco product users and polytobacco users. Students who identified as 'White' were less likely to be a polytobacco user, compared to the combined group of students who reported a different race. This is in contrast to an earlier study by Rigotti and colleagues<sup>8</sup> reporting that dual tobacco users were more likely to be 'White.' Since 2000,

emerging tobacco products may have had more appeal to minority groups. The tobacco industry has a history of targeting ethnic groups in their marketing strategies,<sup>42</sup> potentially putting these groups at higher risk for polytobacco use. However, Miller and colleagues<sup>38</sup> did not report an association between ethnicity and dual tobacco use. More research is needed to investigate the role of race/ethnicity in college student polytobacco use.

The implications of the study findings are of concern. Although rates of cigarette smoking among college students are well documented,<sup>7</sup> the patterns of reported polytobacco use are alarming, and support our premise that college students are both attracted to and using emerging tobacco products in combination with other products. One supposition is that these emerging products are marketed by the tobacco industry specifically to the college-aged population. For example, hookah bars have opened in areas around college campuses, increasing the likelihood of hookah use by college students.<sup>43</sup> In many communities, hookah bars are exempt from comprehensive smoke-free legislation<sup>44</sup> meaning they can open in neighborhoods and locations where young people are likely to visit. In addition, e-cigarettes are marketed by manufacturers through youth-oriented events, national television and radio programming with young audiences, and through the use of social media.<sup>45</sup> These marketing strategies are similar to those used by the tobacco industry in the past to market cigarettes to youth and young adults, and are likely to continue until there is federal regulation to restrict the marketing, labeling and sale of e-cigarettes.<sup>46</sup>

This study was conducted in a tobacco-growing state which consistently reports higher rates of tobacco use than the national average.<sup>47</sup> It is not known how many of the participants were in-state students and if so, whether they were impacted by the pro-tobacco culture. However, the majority of students enrolled at the university are in-state students. Interestingly,

the campus is tobacco-free, and the city in which the study was conducted has a comprehensive smoke-free workplace law. College students comprise a unique population whose patterns and motives for tobacco use may differ from those of adolescents or adults.<sup>48</sup> More research is needed to determine the impact of social and environmental influences on polytobacco use, including the pro-tobacco culture and surrounding smoke- and tobacco-free policies.

One study limitation was the lack of information regarding frequency of lifetime use of certain tobacco products. For cigarettes, we were able to accurately classify participants as former or current tobacco users using both past 30 day smoking and whether they had smoked at least 100 cigarettes in their lifetime. For the other four tobacco product categories, we knew whether students had ever used the product, but no '100 cigarette' analog has been developed to assess lifetime or established use. We may have over-estimated the number of current or former e-cigarette, hookah, smokeless and cigar/little cigar/clove cigarette users by including those who had used a given product fewer than 100 times in their life. This may be particularly true of certain emerging products that may be more linked to experimentation. However, this study is consistent with similar research that has measured current consumption solely as past 30 day use.<sup>8,38</sup> Given the ordinal nature of the tobacco user group (former, single, polytobacco user), it would have been preferable to fit a proportional odds model to determine predictors of level of use. However, the proportional odds assumption was violated, requiring the use of the more general multinomial model. An additional limitation is that it was not possible to make demographic comparisons between those who completed the survey and those who did not, and it is not known whether the sample of current and former tobacco users in this study is representative of all tobacco-using students at this institution, as the demographic profile of that group is not available. This concern is lessened by the fact that the combined sample had

somewhat similar gender and academic status distributions compared to the accessible population, which includes both tobacco users and nonusers. More research is needed with this at-risk population to understand the degree to which these results are generalizable to all tobacco-using college students. Finally, there is a small chance that a student was invited to participate in the study at both time points and was part of both cohorts, which would result in lack of independence among all observations. The likelihood that this occurred is small, both due to the overall response rate of 16% coupled with use of only a portion of the full sample (i.e., ever tobacco users) from among those who responded; the study sample represented less than 3% of the eligible students. In conclusion, polytobacco users were more likely to use emerging tobacco products, an issue of grave concern for college and population health. Men, underclassmen, and non-whites were at higher risk for polytobacco use. As college students are particularly prone to nicotine addiction, which can prolong tobacco use and lead to acute and chronic negative health risks, there is a need to further investigate polytobacco use, particularly among the subgroups identified to be at greater risk. Future research is needed to identify risk factors among college students and develop and test strategies to prevent and treat polytobacco use.

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Table 1. Descriptive statistics of the study sample ( $N = 662$ )

	<i>Mean (SD); range or n (%)</i>
Age	22.4 (6.1); 17-60
Gender	
Male	231 (35.4%)
Female	422 (64.6%)
Race/ethnicity	
White, non-Hispanic	535 (81.9%)
Other race/ethnicity	118 (18.1%)
Academic status	
Lower level undergraduate	325 (49.6%)
Upper level undergraduate	154 (23.5%)
Graduate/other	176 (26.9%)
Residence	
On-campus	207 (31.8%)
Off-campus	445 (68.2%)
Member of social fraternity/sorority	
Yes	138 (21.2%)
No	514 (78.8%)
Cohort	
February	356 (53.8%)
April	306 (46.2%)
Tobacco use status	
Former tobacco user	369 (55.7%)
Single tobacco user	199 (30.1%)
Polytobacco user	94 (14.2%)

Table 2. Multinomial logistic regression model to assess the association of sociodemographic characteristics and cigarette social norms with tobacco user group ( $n = 638$ )

	Polytobacco user vs. Single tobacco user			Polytobacco user vs. Former tobacco user		
	Estimated Odds Ratio ( <i>OR</i> )	95% CI for <i>OR</i>	<i>p</i>	Estimated Odds Ratio ( <i>OR</i> )	95% CI for <i>OR</i>	<i>p</i>
Gender						
Male	1.63	1.24-2.14	<.001	1.53	1.18-1.99	.001
Female	ref	ref		ref	ref	
Race/ethnicity						
White, non-Hispanic	0.72	0.52-1.00	.051	0.76	0.56-1.04	.083
Other race/ethnicity	ref	ref		ref	ref	
Academic Status						
Lower level undergraduate	1.76	1.16-2.66	.008	1.84	1.24-2.73	.002
Upper level undergraduate	0.62	0.39-0.98	.041	0.82	0.52-1.28	.38
Graduate/other	ref	ref		ref	ref	
Residence						
On-campus	0.74	0.54-1.03	.072	0.87	0.64-1.19	.39
Off-campus	ref	ref		ref	ref	
Member of a social fraternity/sorority						
Yes	0.88	0.63-1.22	.45	0.98	0.71-1.36	.91
No	ref	ref		ref	ref	
Cohort						
February	1.36	0.79-2.33	.27	1.07	0.64-1.80	.79
April	ref	ref		ref	ref	
Cigarette social norms	1.26	1.11-1.42	<.001	1.64	1.45-1.85	<.001

Figure 1. Summary of tobacco product use among single tobacco product ( $n = 199$ ) and polytobacco users ( $n = 94$ )

