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The Impact of Flavored ENDS Use Among Adolescents on Daily Use Occasions and Number of Puffs, and Next Day Intentions and Willingness to Vape

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Abstract

Background.—The FDA's policies restricting sale of sweet flavored cartridge-based and disposable electronic nicotine delivery systems (ENDS) comprise important steps toward curbing adolescent ENDS use. However, additional evidence is needed about the contribution of specific flavors to adolescents' ENDS use. This study investigated the effects of flavor use on same day vaping behaviors, and next day intentions and willingness.

Methods.—We collected ecological momentary assessments (EMA) from 50 adolescent past two-week vapers (ages 14–17) over 14 days. Daily EMA data were collected on vaping occasions, total puffs, vaping intentions, vaping willingness, and flavor used.

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Results.—On average, data were obtained on 13.4 days per participant (670 observations). Participants vaped flavors on 87% of days (fruit = 55%; mint = 30%; tobacco = 6%; menthol = 5%, and candy, sweets, or chocolate = 5%). On days when participants vaped fruit flavors, they took more puffs (r=.13, p=.030). On days when they vaped tobacco flavor, they reported more vaping occasions (r=.20, p=.005) and more puffs (r=.15, p=.033). On days when they vaped because of flavor appeal, they reported more vaping occasions (r=.19, p=.001) and more puffs (r=.24, p<.001). On days when they vaped menthol flavor, they were less likely to report willingness to vape the next day (r=−.14, p=.042). Adolescents who reported vaping due to flavor appeal were more likely to report intentions (OR=5.63, p=.035) and willingness to vape the next day (r=.23, p<.001).

Conclusion.—These findings provide additional support for policies restricting the sale of flavored ENDS products to adolescents.

Keywords

adolescents; e-cigarettes; ENDS; nicotine; flavors; ecological momentary assessment

1. Introduction

Electronic nicotine delivery systems (ENDS) use has risen rapidly among adolescents in the U.S., more than doubling between 2016 and 2019.[1] Vaping nicotine poses significant health risks for adolescents, including respiratory disease[2] and an increased likelihood of becoming regular tobacco smokers.[3–5] Adolescents' ENDS use is driven by multiple factors, including availability of appealing flavors.[6] A nationwide study concluded that leading flavor preferences among adolescents are fruit, candy, and other sweet flavors, [7] while a national study of JUUL users found that mint was the most popular flavor among adolescents in 10^{th} and 12^{th} grades and the second most popular flavor among those in 8^{th} grade behind mango.[8] Beyond appeal, flavor variability has been found to be a key reason for adolescents' experimentation, initiation, and continued use of ENDS.[9–11] A recent study showed that among past 6-month adolescent e-cigarette users, those who vaped nontraditional flavors (e.g., fruit, candy, sweets) were more likely to continue vaping and to take more puffs per vaping occasion six months later compared with those who exclusively vaped tobacco-, mint-, or menthol-flavored, or flavorless e-cigarettes. [12] Additional research has shown that use of flavored ENDS products by adolescents is associated with favorable perceptions of tobacco use,[13,14] initiation of tobacco product use,[5] and subsequent nicotine dependence.[5,15]

To counteract the trends and associated consequences of adolescent ENDS use, the U.S. Food and Drug Administration (FDA) issued a policy in February 2020 outlining their intention to prioritize enforcement of illegally marketed and unauthorized ENDS products, including flavored, cartridge-based ENDS products other than tobacco- or menthol-flavored. [16,17] Tobacco and menthol flavors were excluded because of the relatively low reported use of these flavors among youth,[18] as well as the potential impact of banning these flavors on adults attempting switch from tobacco cigarettes.[17] More recently, the FDA sent warnings to companies like Puff Bar, telling them to remove fruity disposable e-cigarettes from the market, including flavors like mango and strawberry.[19]

While these policies are important steps to curbing the initiation and frequency of adolescent vaping, public health experts express concern that youth will simply switch to tobacco or menthol flavors, given reduced access to fruit, candy, or mint.[17,20,21] There is also concern that ENDS users will continue to use flavors by adding flavor agents themselves, by switching to tank systems where flavor options are still available, or by obtaining illegally manufactured flavored products.[22] To further inform policy and regulation of the manufacture and sale of flavored ENDS products, additional evidence is needed to understand the contribution of specific flavors, including tobacco and menthol, to adolescent ENDS use, intentions, and willingness.

Results of a systematic review indicated that fruit- and candy-flavored e-cigarettes are perceived as less harmful than tobacco-flavored e-cigarettes.[9] This review also showed that the availability of appealing flavors is associated with an increased willingness to try e-cigarettes and initiation of e-cigarette and tobacco cigarette use among non-smoking youth. According to the Theory of Planned Behavior[23,24] and Prototype Willingness Model,[25–27] perceptions about the appeal of flavors and their harmfulness should be associated with ENDS use, intentions and willingness. However, limited research has examined how specific flavor types, including tobacco and menthol, are associated with ENDS use, intentions, and willingness.

To extend growing research in this area, the overall goal of this study was to investigate the effects of day-to-day adolescent use of flavors on vaping nicotine occasions and total puffs, and next day intentions and willingness to vape nicotine. Our study used ecological momentary assessment (EMA) methods, which involve repeated sampling of behaviors and experiences as they occur in natural environments, minimizing recall bias, maximizing ecological validity, and allowing assessment of micro-processes that influence behavior in real-world contexts.[28] This is the first study to use EMA to measure ENDS use in an adolescent population and consider how use of specific flavors effects nicotine use, willingness, and intentions.

Based on theory and prior research, we hypothesized that adolescents who vaped with fruit-, mint-, or candy-flavored ENDS would be significantly more likely to report increased use occasions and number of puffs on the same day, as well as greater intentions and willingness to vape nicotine the next day. We also hypothesized that adolescents who reported vaping because of flavor appeal (“because it comes in flavors I like”) the last time they vaped would be more likely to report significant increases in the same outcomes.

2. Method

2.1. Participants, recruitment, selection, and setting

Study protocols and measures were approved by the Pacific Institute for Research and Evaluation’s Institutional Review Board. Adolescents were recruited to participate in surveys that asked about opinions, perceptions, marketing exposures, and use of e-cigarettes and tobacco through a study website and recruitment flyers. Initial parental consent was obtained for adolescents to take an online screener used to determine eligibility. Inclusion criteria were being between ages 14 and 17 years old, living within a 100-mile radius of

Louisville, Kentucky, and self-report of past two-week vaping. To maintain confidentiality for youth participants, neither parents nor adolescents were informed that past two-week vaping was an inclusion criterion. In total, the first 54 eligible adolescents were enrolled. Of those, three did not complete the baseline survey and never progressed to the EMA surveys, and one dropped out of the study on the second day of EMA. Those four adolescents were replaced by the next four eligible adolescents on our recruiting list in order to obtain a sample of 50 adolescents (to ensure power). Full parental consent and youth assent were obtained electronically. Participants were asked to complete surveys over two weeks (14 days). On average, each participant provided 13.4 days of EMA data, resulting in 670 of 700 possible observations for a 96% completion rate.

2.2. Study design and protocols

Data were collected from January through October 2018. Participants were sent a link via text or e-mail to a 30-minute initial online survey that included demographics, individual characteristics, and substance use behaviors. Next, an online SMS text platform was used to send survey links and reminders. Over a two-week period, EMA data were collected daily Monday through Thursday at 4 pm, twice on Friday at 4 pm and 8 pm, and three times on Saturday and Sunday at 11 am, 4 pm, and 8 pm. In the Monday through Thursday 4pm survey, participants were asked to report their daily vaping behaviors and reasons for vaping during the past 24 hours (4 pm to 4 pm), as well as their intentions and willingness to vape the next day. On weekend surveys (Friday through Sunday), they reported vaping behaviors and reasons for vaping at the three timepoints which comprised a 24-hour period. We aggregated the weekend responses of vaping behaviors and reasons for vaping into one measure per day to capture the full 24 hours with each assessment (i.e., up to 14 daily assessments from 50 participants). They were asked about their intentions and willingness to vape the next day only during the daily 4 pm surveys. Incentives for study participation included: $15 for completing the initial online survey, $5 for each completed EMA survey, a $20 bonus if they completed all EMA surveys, and $15 for returning the phone and charger.

2.3. Daily measures

2.3.1. ENDS use—Participants were asked to report whether they vaped nicotine during the survey window. If they said yes, they were asked how many times they vaped nicotine (i.e., number of occasions) and how many total puffs they typically vaped on each occasion during the survey window, and what flavors they used the last time they vaped (select all that apply). Responses for flavors were categorized as: (a) fruit; (b) mint; (c) candy, sweets, or chocolate; (d) menthol; and (e) tobacco. To create daily vaping measures for weekend days, we summed use occasions across all survey time windows to a 24-hour period. The total number of puffs per day was defined as the product of the sum of use occasions and the mean of typical puffs per occasion that day. Since weekend data were aggregated across multiple observations to the daily level, we selected the last flavor use occasion to make these observations consistent with weekday observations asking about the last flavor use occasion.

2.3.2. Motivations for ENDS use—Participants were asked about their motivations for vaping nicotine the last time they vaped during the survey window. Options included (a)

because it was easy to get, (b) it comes in flavors I like, (c) I am trying to quit cigarettes, and (d) it feels good. Adolescents were asked to select all that apply. For our analyses, we only examined the motivation of flavor appeal (i.e., vaping because it comes in flavors I like). Because we inquired about motivations for the last vaping occasion, the motivation for the last use occasion was selected on weekend days when there were multiple observations.

2.3.3. Intentions and willingness—At the 4pm survey, adolescents were asked whether they planned to vape nicotine the next day (yes/no). In addition, we adapted a measure by Wills and colleagues[29] to assess whether they would be willing to vape nicotine the next day if they were with a group of friends who were vaping. Specifically, they were asked about their willingness to (a) vape one puff, (b) a few puffs, and (c) a lot of puffs. Responses were (1) “not at all willing”, (2) “somewhat willing”, (3) “willing”, and (4) “very willing”. A mean willingness score across the 3 items was obtained.

2.4. Initial survey measures

2.4.1. Individual characteristics—Participants were asked about individual characteristics, including age, sex, and race/ethnicity. Socioeconomic status was assessed by asking how much money they have in a typical week to spend on whatever they want, not including basic necessities. The nine response options (e.g., <$5; $5-$10) were coded as category midpoints to approximate an interval measure.

2.4.2 Past 30-day ENDS and tobacco use—Measures for past 30-day use of e-cigarette and tobacco use were from the National Youth Tobacco Survey.[30] Youth were asked how many of the past 30 days they vaped e-cigarettes with nicotine, or smoked tobacco cigarettes.

2.5. Data analyses

Given our focus on nicotine use and vaping flavors, our analyses included only occasions on which vaping with nicotine and flavors occurred. Due to low prevalence (13% of occasions), we did not include occasions when youth vaped nicotine with no flavor. Our primary analyses were random intercept mixed model linear and logistic regressions, accounting for daily observations nested within individuals. There was a great deal of variability among participants, as evidenced by large intraclass correlation coefficients (ICC) (See Table 1). Binomial logistic regressions were used for nominal outcomes (i.e., intentions) and linear regressions were used for continuous outcomes (i.e., number of occasions, number of puffs, and willingness to vape). The effect size r ($r = [(t^2)/(t^2+df)]^{0.5}$)[31] was calculated for linear models.

To determine whether models should have statistical controls for growth patterns, the growth patterns for each dependent measure (linear, quadratic, and cubic) within a period of one week were examined. Significant growth contrasts and their lower order counterparts were included as covariates in subsequent models. Substantive models included age, sex, and weekly spending money as covariates. Separate models were run with use of specific flavors and use because of flavor appeal as predictors for each dependent measure. All predictors were treated as time variant (e.g., use of menthol flavor that day as a predictor of puffs on

that day). We did not examine between participant variability in these models (e.g., percent of menthol use days across the two weeks as a predictor of puffs on each day) because preliminary models provided estimates with extremely large confidence intervals, suggesting 50 participants was insufficient to provide accurate estimates. All models were fit using the R framework for statistical computing[32] with the lme4[33] and lmerTest[34] libraries.

3. Results

3.1. Participant characteristics

Table 1 shows participant characteristics and ENDS use behaviors. Participants had a mean age of 16.22 (SD=.86) and they were well balanced on sex (42% male). The majority reported being Non-Hispanic White (90%). Individuals reported having between $4 and $151 (quartiles: $19, $29, and $89) per week as spending money.

3.2. Past 30-day ENDS and tobacco use

Nearly all study participants indicated using ENDS with nicotine in the past 30 days (98%) and about one-quarter (34%) used tobacco cigarettes in the past 30 days.

3.3. Daily ENDS use, intentions, and willingness

Participants vaped nicotine on an average of seven occasions per day (M=7.09, SD=12.69) and took 54 total puffs of nicotine per day (M=53.52, SD=122.99). Considering use patterns, participants vaped nicotine exclusively on 44% of occasions. The other 56% of occasions were comprised of 39% no use, 9% tobacco cigarette only use, and 8% dual use. Participants reported intentions to vape the next day on about half of occasions (47%), and participants, on average, reported being “willing” to vape the next day (M=3.14, SD=.95).

3.4. Flavors use

Adolescents used flavors when they vaped nicotine on 87% of occasions, sometimes using more than one flavor during an occasion. They vaped fruit flavors on 55% of occasions; mint on 30% of occasions; tobacco flavor on 6% of occasions; menthol flavor on 5% of occasions; and candy, sweets, or chocolate on 5% of occasions. There was a considerable amount of variability among participants (ICCs ranged from .38 to .80) in their flavor use across days. There was higher consistency for those who used tobacco flavors (r=.80), and a lower consistency for those who used mint (r=.46); menthol (r=.43); candy, sweets, or chocolate (r=.40); and fruit flavors (r=.38).

3.5. Flavor predictors of ENDS use occasions, puffs, intentions, and willingness

Table 2 shows results of the regression models examining associations between flavor and vaping on a given day and intentions and willingness to vape the next day. Controlling for covariates, on days when participants vaped fruit flavors, they reported more total puffs on that day (r=.13; 95% CI: .01 to .25; p=.03). On days when they vaped tobacco flavor, they reported more vaping occasions (r=.20; 95% CI: .06 to .32; p=.005) and more total puffs on that day (r=.15; 95% CI: .01 to .29; p=.033). On days when participants vaped because of the appeal of flavors, they reported more vaping occasions (r=.19; 95% CI: .08 to .29;

p=.001) and more total puffs on that day (r=.24; 95% CI: .13 to .34; p<.001). On days when adolescents vaped menthol flavor, they were less likely to report willingness to vape the next day (r=−.14; 95% CI: −.26 to −.01; p=.042). Adolescents who reported vaping because of the appeal of flavors were more likely to report intentions to vape (OR=5.63; 95% CI: 1.13 to 27.99; p=.035) and greater willingness to vape (r=.23; 95% CI: .12 to 33; p<.001) the next day.

4. Discussion

This is the first study to use EMA to investigate the effects of day-to-day use of specific flavors among adolescents on vaping nicotine and intentions and willingness to vape. Our hypothesis that the use of fruit, mint, or candy flavors increase the number of use occasions and more puffs on a given day, as well as with increased willingness and intentions to vape nicotine the next day, was partially supported. Adolescents who vaped fruit-flavored nicotine reported more total puffs on that same day (M=16.72) than those that did not (M=12.31), and the effect of vaping fruit flavors on number of vaping occasions that day approached significance. Previous research showing that flavoring enhances the rewarding and reinforcing value of vaping with nicotine[35–37] may explain why adolescents who were vaping with fruit flavors reported taking more puffs. In addition, these results are consistent with a study by Leventhal and colleagues[12] which showed that adolescent past-6-month ENDS users who vaped with nontraditional flavors (e.g., fruit) were more likely to continue vaping and report more puffs per vaping occasion than those exclusively using tobacco-, mint-, or menthol- flavors or flavorless ENDS six months later.[12] Together, findings from the two studies suggest that use of sweet and fruity flavors may have both immediate and longer-term effects on use occasions and number of puffs among adolescents.

Surprisingly, vaping mint and vaping candy flavors were not significantly associated with more vaping occasions or total puffs per day. This is in contrast to the previously mentioned study[12], but this difference may reflect the fact that we assessed these nontraditional flavors individually and not under one category (i.e., nontraditional flavors). It may also be that the effects of use of these specific flavors on vaping occasions and puffs are not immediate (i.e., same day), but longer-term effects. Vaping fruit, mint, or candy flavors was not significantly associated with greater intentions or willingness to use e-cigarettes the next day. It is possible that intentions and willingness to vape do not change based on use of specific flavors, but rather are based on the overall appeal of sweet flavors. In fact, our hypothesis that flavor appeal would increase vaping occasions and total puffs on that same day, as well as intentions and willingness to vape the next day, was supported. These findings extend existing research that suggests flavor options and variability are key reasons for ENDS use among adolescents, as well as for intentions to vape in the future.[9–11,38]

Though this study was conducted prior to the FDA’s policy that restricted fruit-, candy-, and mint-flavored cartridge-based ENDS products, as well as the recent call for removal of fruit disposable e-cigarettes, assessing the impact of specific flavors on ENDS use, intentions and willingness is important as youth can still use flavors through other devices and can still access menthol and tobacco flavors. Further research should assess how device type, source of and access to flavors may be associated with increased ENDS use and related perceptions.

Source of access to flavors is highly important because vaping products acquired informally (e.g., from friends, family, or online dealers) have been linked to most of the cases in the EVALI (e-cigarette or vaping associated lung injury) outbreak.[39–41]

On occasions when adolescents vaped tobacco flavors, they reported more vaping occasions and total puffs on that day. These findings contrast research showing that harsh or bitter flavors are not as appealing or rewarding as fruit flavors,[35,42] and suggest that some adolescents vape with tobacco-flavored products despite being less palatable than other flavors. This finding also differs from the Leventhal and colleagues study[12], which showed that adolescents who exclusively used tobacco flavor were less likely to report more use occasions and puffs when compared to those vaping with nontraditional flavors. However, it is possible that the sample in the present study represents a higher risk group of adolescents, as adolescents in our study were past-two-week vapers and those in the other study were past six-month vapers. In addition, recent research suggests that the appeal of fruit versus tobacco flavors is strongest among never smokers versus current or former smokers.[7,8] This is another plausible explanation; however, we did not observe this relationship at the between-participant level with our small sample of adolescents. Further research is needed to determine differences in the impact of unique flavors on adolescents who are regular or heavy ENDS users. Although the results presented here represent a small sample of adolescents, the fact that vaping with tobacco flavors predicted more use occasions and total puffs per day among adolescents is important in light of the FDA's regulations on flavored ENDS products that exclude tobacco flavor, and further research is needed to determine whether this finding holds among a larger sample of adolescent vapers.

Adolescents who vaped with menthol flavor were less likely to report willingness to vape the next day. Research showing that there is less harm perception associated with non-menthol flavors[9] may help explain this finding. It is possible that for adolescents in our study the perception of harm from vaping with menthol flavor outweighed the sweet flavor appeal. Future research should examine perceptions of harms versus overall appeal related to specific flavor types, including tobacco and menthol, to adequately assess the impact of the FDA regulations.

4.1. Strengths and limitations

A key strength of our study was the use of EMA to measure vaping behaviors, motivations, and intentions and willingness to use the next day among a young group of adolescents who reported past two-week vaping. EMA methods reduce recall bias compared to cross-sectional or longitudinal survey methods that rely on past 30-day and past-year behavior measures. While EMA offers more precise measurement and allows for an examination of daily use trends, implementation costs usually dictate that fewer participants are surveyed. The present pilot study had 50 participants, which was sufficient to examine within-participant variability, but proved insufficient for examining between-participant variability. Nonetheless, the significant effects demonstrated in this paper suggest that there is indeed between-participant variability in flavor use. Another limitation of this study is that while 670 observations (of 50 participants) is sufficient for examining within-participant variability, flavor use could only be examined when vaping nicotine occasions occurred with

a flavor, which further reduced our sample size to 267 observations. While statistical power becomes a concern with reduced sample size, we suspect this is not the case, given that our results were consistent across dependent measures.

5. Conclusion

We examined the effects of day-to-day adolescent use of flavors on vaping nicotine, and next day intentions and willingness to vape nicotine. Results from our study provide support for further development of policies restricting the marketing and sale of flavored ENDS products to adolescents, and suggest that regulatory efforts should consider stronger enforcement to curb illegal sales of these products. Given our findings on the impact of tobacco flavor specifically, further research is needed to assess the contribution of unique flavors among regular or heavy vapers versus occasional vapers. As this study was conducted prior to the FDA's regulation of flavored ENDS products and the call for removal of fruity disposable devices,[19] further research is needed to assess flavor use, device type, sources, and access among adolescents, as well as their associations with ENDS use, intentions, and willingness given these restrictions. Moreover, it is critical that future research examines how FDA regulations are being enforced locally as well as how regulations and enforcement have impacted flavor use and its associations with ENDS use, intentions, and willingness, particularly among vulnerable populations. Efforts at the national, state, and local levels are critical to make flavored ENDS use less acceptable, accessible, and appealing to youth.[6,17]

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Highlights

- This is one of the first EMA studies on measuring ENDS use among adolescents.
- Vaping tobacco flavors increases same day number of use occasions and total puffs.
- Vaping fruit flavors increases same day total number of puffs.
- Flavor appeal increases same day use occasions, number of puffs, and intentions.
- Results support regulatory efforts to restrict the sale of flavored ENDS products.

Table 1.

Percentages, means (and standard deviations) for characteristics, ENDS use, intentions, and willingness, and flavors used.

	Mean/Percent	ICC
Individual Characteristics		
Age	16.22(.86)	--
Male	42%	--
Non-Hispanic White	90%	--
Spending money per week	$52.08 ($49.47)	--
Past 30-day ENDS use	98%	--
Past 30-day tobacco cigarette use	34%	--
EMA Daily Use Measures		
Vaping occasions per day	7.09 (12.69)	.62
Vaping total puffs per day	53.52 (122.99)	.50
Vaping intentions (next day)	47%	.67
Vaping willingness	3.14 (.95)	.86
Exclusive vaping (% of days)	44%	.51
Flavor used last vaping occasion	87%	.62
Menthol	5%	.43
Candy, sweets, or chocolate	5%	.40
Tobacco	6%	.80
Mint	30%	.46
Fruit	55%	.38

Note: Calculations based on 670 repeated observations and 50 individuals.

Table 2.

Random intercept logistic and linear regressions examining flavor type as predictors of the magnitude of ENDS use, and intentions and willingness to vape the next day.

	B	B 95% CI	p	r	r 95% CI
Vaping Occasions per Day					
Flavors (N_{obs}=267)					
Menthol	−6.46	−14.21, 1.29	.104	−.10	−.22, .02
Mint	1.01	−3.24, 5.27	.641	.03	−.09, .15
Fruit	3.59	−.27, 7.46	.070	.11	−.01, .23
Candy, sweets, or chocolate	−.93	−8.61, 6.74	.812	−.01	−.14, .11
Tobacco	16.03	5.10, 26.97	.005	.20	.06, .32
Flavor Appeal Motivation (N_{obs}=335)					
“comes in flavors I like”	7.16	3.11, 11.21	.001	.19	.08, .29
Vaping Total Puffs per Day					
Flavors (N_{obs}=267)					
Menthol	−60.46	−149.80, 28.88	.186	−.08	−.20, .04
Mint	34.94	−14.06, 83.95	.164	.09	−.04, .21
Fruit	49.86	5.09, 94.64	.030	.13	.01, .25
Candy, sweets, or chocolate	20.69	−67.98, 109.37	.648	.03	−.09, .15
Tobacco	136.78	11.74, 261.81	.033	.15	.01, .29
Flavor Appeal Motivation (N_{obs}=335)					
“comes in flavors I like”	98.88	53.39, 144.37	<.001	.24	.13, .34
Willingness to Vape the Next Day					
Flavors (N_{obs}=267)					
Menthol	−.20	−.39, −.02	.042	−.14	−.26, −.01
Mint	−.02	−.13, .08	.748	−.03	−.16, .10
Fruit	−.03	−.13, .06	.481	−.05	−.18, .08
Candy, sweets, or chocolate	−.05	−.24, .14	.599	−.03	−.16, .10
Tobacco	.00	−.28, .29	.987	.00	−.13, .13
Flavor Appeal Motivation (N_{obs}=335)					
“comes in flavors I like”	.26	.13, .38	<.001	.23	.12, .33
	OR	**OR 95% CI**			
Intentions to Vape the Next Day					
Flavors (N_{obs}=267)					
Menthol	.75	.08, 6.71	.696		
Mint	.58	.14, 2.49	.310		
Fruit	1.14	.30, 4.26	.996		
Candy, sweets, or chocolate	.62	.04, 10.97	.676		
Tobacco	1.E+05	.00, >1.E+06	.976		
Flavor Appeal Motivation (N_{obs}=335)					

	B	B 95% CI	p	r	r 95% CI
“comes in flavors I like”	5.63	1.13, 27.99	.035		

Note: Tests included sex, age, and spending money as covariates; time/growth contrasts were also included as covariates in models when statistically significant.