

Background and Rationale

E-cigarette (vaping) use has increased dramatically in recent years. While switching to vaping might benefit cigarette smokers, there is a risk of increased use by current nonsmokers. Little is known about the conditions under which current smokers would be willing to switch to smoking, or the factors that might attract nonsmokers to vaping.

Objective

To understand what policy-relevant tobacco smoking factors are more significant to adult smokers and nonsmokers in the U.S. and to examine how effective policies aimed at increasing the price of tobacco products could be in reducing smoking or vaping.

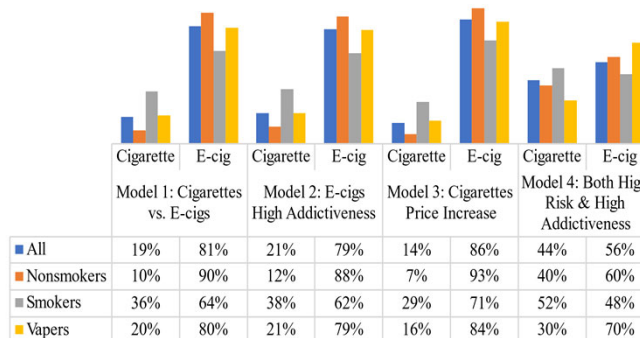
Study Design and Participants

525 adults aged 18 to 88 years made 16 choices between two alternatives that differed in characteristics. All the attribute levels are shown in table 1. Results were analyzed using conditional logistic regression for the entire sample and stratified by nonsmokers, smokers, and vapers.

Table 1. DCE Attributes and Levels

Tobacco Product	Cigarettes	Cigars	Hookah	E-cigs	
Place to Smoke	Pleasant		Okay	Uncomfortable	
Kick or Satisfaction	Very bad	Somewhat bad	Neutral	Somewhat good	Very good
Cost	No Cost	\$0.25	\$0.50	\$1.50	\$5.00
Addictiveness	Not at all	Moderately		Highly	
Smell	Pleasant	Odorless		Strong Odor	
Long-term health risks	None	Some chance	Moderate chance	High chance	

Figure 1. Policy Options Marginal Analysis



Results

The results on table 2 compare the preferences and tradeoffs between nonsmokers, smokers and vapers, and willingness-to-pay (WTP) for each attribute.

- Smokers, vapers, and nonsmokers stated cigars and hookahs as their least preferred tobacco smoking option. Even though e-cigarettes keep a negative slope for smokers, the magnitude is smaller to their aversion for the other products.
- Smokers and vapers have a significant aversion for uncomfortable places to smoke, disliked a very bad kick or satisfaction and are more concerned with cost compared to vapers.
- People who vape e-cigarettes had a significant approval of the product (WTP \$3.98) and preferred a somewhat good kick.
- Nonsmokers reported a statistically significant affinity for e-cigarettes should they be in a situation to smoke (WTP \$1.34). This group disliked strong tobacco odors and are highly sensitive to high addictiveness of tobacco products. Also, nonsmokers are the most concerned with long-term health risks and cost.

Table 2. Willingness to Pay

Type of Product	Nonsmokers		Smokers		Vapers	
	β (SE)	WTP	β (SE)	WTP	β (SE)	WTP
Cigarette	<i>omitted</i>		<i>omitted</i>		<i>omitted</i>	
Cigar	-.036 (.06)	-\$0.30	-.839***(.07)	-\$7.84	-.444***(.12)	-\$5.41
Hookah	-.026 (.06)	-\$0.21	-.859***(.07)	-\$8.03	-.205 (.12)	-\$2.50
E-cig	.163**(.06)	\$1.34	-.378***(.06)	-\$3.53	.326**(.12)	\$3.98
Place to Smoke						
Pleasant	.04 (.05)	\$0.33	-.082 (.05)	-\$0.77	-.089 (.10)	-\$1.09
Okay	<i>omitted</i>		<i>omitted</i>		<i>omitted</i>	
Uncomfortable	.02 (.05)	\$0.16	-.201**(.06)	-\$1.88	-.317**(.11)	-\$3.87
Kick or Satisfaction						
Very bad	-.176**(.06)	-\$1.44	-.166*(.07)	-\$1.55	.101 (.13)	\$1.23
Somewhat bad	-.121 (.07)	-\$0.99	-.137 (.08)	-\$1.28	-.009 (.14)	-\$0.11
Neutral	<i>omitted</i>		<i>omitted</i>		<i>omitted</i>	
Somewhat good	.032 (.07)	\$0.26	.037 (.08)	\$0.35	.326*(.15)	\$3.98
Very good	.060 (.07)	\$0.49	.028 (.08)	\$0.26	.206 (.14)	\$2.51
Cost						
Linear	-.122***(.01)	-\$1.00	-.107***(.01)	-\$1.00	-.082**(.02)	-\$1.00
Addictiveness						
Not at all addictive	<i>omitted</i>		<i>omitted</i>		<i>omitted</i>	
Moderately addictive	-.091 (.05)	-\$0.75	.018 (.05)	\$0.17	.119 (.10)	\$1.45
Highly addictive	-.363***(.05)	-\$2.98	-.044 (.06)	-\$0.41	.026 (.10)	\$0.32
Smell						
Pleasant	-.086 (.05)	-\$0.70	.044 (.05)	\$0.41	.073 (.10)	\$0.89
Odorless	<i>omitted</i>		<i>omitted</i>		<i>omitted</i>	
Strong odor	-.254***(.05)	-\$2.08	-.099 (.05)	-\$0.93	-.194 (.10)	-\$2.37
Long-term health risks						
Linear	-.021***(.00)	-\$0.17	-.007***(.00)	-\$0.07	-.006***(.00)	-\$0.07

Policy Models

To simulate the effect that a price increase could affect all groups, we modeled raising the price of cigarettes to \$4.00 per smoker. The results are shown in figure 1. The findings indicate a decrease in the preference of the cigarette products of 6% for all, 3% for nonsmokers, 7% for smokers, and 4% for vapers.

Conclusion

Our study suggests that increasing the price of cigarettes would lead to a limited increase in the probability smokers to switch to vaping. Our results support that isolated strategies may be less effective at changing smoking behavior compared to integrating a list of policies and interventions. Furthermore, we have advanced our understanding about the views of current nonsmokers toward cigarettes and vaping, suggesting that price increases and increased knowledge of addiction would likely deter nonsmokers from vaping.