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## Price Promotion Receipt and Use Progression of Any Tobacco, Cigarettes, E-cigarettes, and Cigars Among U.S. Youth Between 2016 and 2018

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### Abstract

**Background:** Tobacco price promotions may prompt tobacco trials among youth. We assessed whether receiving price promotions for any tobacco, cigarettes, e-cigarettes, and cigars was associated with product use progression.

**Methods:** The analysis included a nationally representative sample of youth never tobacco users (ages 12–16; n=9,405) from Wave 4 (2016–2018) of the Population Assessment of Tobacco and Health (PATH) Study. We assessed past-year receipt of price promotions and use progression (initiation, current use, and ever regular use) for any tobacco, cigarettes, e-cigarettes, and cigars one year later at Wave 4.5 (2017–2018). Multivariable logistic regressions were used to examine the associations between receiving price promotions and use progression by product type, controlling for covariates.

**Results:** At Wave 4.5, 9.4% of youth initiated any tobacco (1.8%, 7.8%, 0.9% for cigarettes, e-cigarettes, and cigars), and 5.4% received any price promotions (3.8%, 3.1%, and 0.9% for cigarettes, e-cigarettes, and cigars). Receiving any tobacco price promotions was associated with any tobacco initiation (AOR=1.77; 95% CI=1.30, 2.41), current use (AOR=1.54; 95% CI=1.06, 2.23), and ever regular use (AOR=1.76; 95% CI=1.04, 3.10). Receiving e-cigarette price promotions was associated with e-cigarette initiation (AOR=1.78; 95% CI=1.18, 2.26), current use (AOR=1.88; 95% CI=1.17, 3.02), and ever regular use (AOR=2.10; 95% CI=1.02, 4.40). The associations specific to cigarettes and cigars were only found for product initiation.

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**Discussion:** Receiving price promotions for any tobacco and e-cigarettes was respectively associated with the use progression of any tobacco and e-cigarettes. Continuous monitoring of tobacco marketing activities is needed to identify youth-appealing price promotion tactics.

### Keywords

Tobacco Price Promotion; Tobacco Marketing; Youth Tobacco Use; E-cigarettes; Cigarettes; Cigars

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## INTRODUCTION

The overall tobacco use among youth has risen over the past few years in the U.S.<sup>1</sup> Specifically, between 2017 and 2019, past-30-day use of any tobacco products among middle school and high school students rose from 5.6% to 24.3%, and 19.5% to 36.5%, respectively.<sup>2</sup> This rapid increase was mainly driven by the surge in e-cigarette use, reaching a past-30-day e-cigarette use prevalence of 10.5% among middle and 27.5% among high school students in 2019.<sup>3</sup> This surge in youth e-cigarette use is concerning given that e-cigarette use can lead to nicotine addiction, respiratory and lung diseases, and use of combustible tobacco products including cigarettes and cigars.<sup>4-6</sup> Additionally, over the past years, combustible tobacco products (cigarettes and cigars) remained one of the most commonly used products among U.S. youth,<sup>1-3</sup> potentially leading to long-term adverse health outcomes such as cancers and cardiovascular diseases.<sup>7</sup> Although youth past-30-day e-cigarette and tobacco use prevalence slightly decreased between 2019 and 2020,<sup>8</sup> continued efforts to monitor the trend and identify and reduce risk factors of tobacco use among youth are greatly needed to protect public health.

One important factor shaping youth tobacco use is tobacco marketing. A substantial body of evidence has demonstrated the influence of tobacco marketing exposure on tobacco product uptake and continued use among U.S. youth.<sup>9</sup> In particular, tobacco price promotions or discounts (see Figure 1 for examples) are heavily used by the tobacco industry to market its products to new and returning consumers. Each year the tobacco industry spends most of its marketing and promotion budget on price discounts (in 2018, 85.8% of the total budget, equaling 7.2 billion U.S. dollars).<sup>10</sup> Receiving and/or using tobacco price promotions might prompt tobacco trials or continue use by keeping tobacco products affordable among price-sensitive populations, especially youth.<sup>11-15</sup> Recent evidence has shown that between 2017 and 2018, seeing tobacco marketing materials, including those featuring appealing flavors and young models, prompted youth to try new tobacco products at substantially high rates.<sup>16-18</sup> Little evidence is available, however, to examine the potential linkage between tobacco price promotions and youth's tobacco uptake and continued use during this critical time period.

The literature examining the associations between tobacco price promotion exposure and tobacco use in the U.S. is also limited in several ways. First, most of these studies examining such associations focused on the adult population,<sup>15,19-21</sup> rather than youth.<sup>12</sup> Second, these studies examined tobacco initiation or current use as the main outcomes,<sup>12,15,19-21</sup> rather than the more progressed, addictive tobacco use behavior (e.g., frequent and regular tobacco

use) that may result in long-term use and difficulty quitting.<sup>22,23</sup> Third, nearly all studies that examined these associations focused on exposure to price promotions for tobacco in general or cigarettes and e-cigarettes in particular,<sup>12,15,19–21</sup> often not including cigar products. Cigars have recently become the most commonly smoked combustible tobacco products among U.S. youth,<sup>1</sup> and cigarillos, the most widely used cigar product type, are often sold in multipacks with price discount labels shown on their packaging (e.g., “2 for \$0.99” and “Save on 5”).<sup>24,25</sup> Finally, previous studies<sup>12,15,19–21</sup> did not control for tobacco advertising exposure. As a result, little is known about whether youth’s tobacco use behavior change is attributable primarily to tobacco price promotions or other youth-appealing marketing features such as models or flavors.

Considering these gaps in our knowledge, this study examined the associations between receiving price promotions and use progression for any tobacco products, cigarettes, e-cigarettes, and cigars among youth during the national surge in tobacco use between 2017 and 2018. Cigarettes, e-cigarettes, and cigars were chosen as specific product types to examine in this study mainly because U.S. youth had the highest use prevalence of these products.<sup>2,3</sup> We also accounted for youth’s overall tobacco advertising exposure to assess the independent associations between receiving tobacco price promotions and tobacco use.

## METHODS

### Study Sample

We used data from Wave 4 (December 1, 2016–January 3, 2018) and Wave 4.5 (December 1, 2017–December 1, 2018) youth survey public-use files from the Population Assessment of Tobacco and Health (PATH) Study, which includes nationally representative, longitudinal cohorts of civilian, non-institutionalized youth in the United States. Respondents completed the Wave 4.5 survey approximately one year following their Wave 4 survey date.<sup>26</sup> The PATH Study’s response rate at Wave 1 was 78.4% for youth. The retention rates for Waves 4 and 4.5 among Wave 1 youth respondents were 79.5% and 74.5%, respectively.<sup>26</sup> More details about the PATH Study can be found elsewhere.<sup>27</sup> We restricted the sample to youth respondents (ages 12–16, n=9,405) who completed both Waves 4 and 4.5 surveys and had never used any type of tobacco products (cigarettes, e-cigarettes, cigars, hookah, smokeless tobacco, dissolvable tobacco, tobacco pipes, bidis, or kreteks) at Wave 4.

### Predictor Variables: Past-Year Receipt of Product Price Promotions

The Wave 4.5 of the PATH Study measured receiving product price promotions in the past year by product type using the question: “In the past 12 months, have you received discounts or coupons for any of the following products. Choose all that apply.” The tobacco product options were “Cigarettes,” “E-cigarettes or other electronic nicotine products (including e-liquid),” “Cigars,” “Shisha or hookah tobacco,” “Snus,” “Other types of smokeless tobacco (such as dip, spit or chew),” and “Some other type of tobacco product.” We created four variables to indicate receiving price promotions for any tobacco (Yes/No), cigarettes (Yes/No), e-cigarettes (Yes/No), and cigars (Yes/No) based on the specific product chosen by the respondents. We did not examine product-specific price promotions or behavioral use outcomes for shisha, snus, or smokeless tobacco, as according to the current analysis, both

the prevalence of receiving price promotions for these products and using these products were low.

### **Response Variable: Past-Year Product Use Progression**

We created product use outcomes (initiation, current use, ever regular use) at Wave 4.5 to capture product use progression over a one-year period between Waves 4 and 4.5. First, we created a new variable to measure any tobacco initiation by using the PATH Study's "derived variables"<sup>26</sup> that captured ever use of any type of tobacco products (cigarettes, e-cigarettes, cigars, hookah, smokeless tobacco, dissolvable tobacco, tobacco pipes, bidis, or kreteks) between Waves 4 and 4.5. Three variables of initiating cigarettes, e-cigarettes, and cigars were also created by using the corresponding "derived variables"<sup>26</sup> that captured ever use of specific products. Similarly, we created a new variable to measure current use of any tobacco by using the PATH Study's "derived variables" that captured past-30-day use of any type of tobacco products at Wave 4.5. Three variables of current use of cigarettes, e-cigarettes, and cigars were also created by using the "derived variables" that captured past-30-day use of the corresponding products at Wave 4.5. Finally, we measured ever regular use of tobacco products by using the question "Have you ever smoked or used [Tobacco Product] fairly regularly?" with response options of "Yes" and "No." Specifically, we used these items to create variables that captured ever regular use of any tobacco, cigarettes, e-cigarettes, and cigars. The PATH Study used three types of cigar products (large cigars, cigarillos, and filtered cigars) for measuring behavioral use outcomes.<sup>28</sup> In this analysis, we combined three types of cigar products and generated behavioral use outcomes of any cigar products.<sup>28</sup>

### **Respondent Characteristics and Covariates**

We used the following respondent characteristics at Wave 4 as covariates (see Table 1 for variable categories). Demographic characteristics were age, gender identity, race/ethnicity, annual household income, and highest educational attainment of parents. Psycho-social characteristics were self-reported past-year internalizing problems (e.g., depression, anxiety, and distress; Yes/No) and externalizing problems (e.g., having a hard time paying attention, having a hard time listening to directions; Yes/No).<sup>29</sup> Characteristics related to pro-tobacco use social environment were living with someone using tobacco products (Yes/No) and having at least one best friend using tobacco (Yes/No). Finally, tobacco advertising exposure was measured by two questions "In the past 30 days, have you noticed [Product Name] being advertised in any of the following places?" with "Product Name" replaced with "E-cigarettes or other electronic nicotine products" and "Cigarettes or other tobacco products." Response options to both questions included a wide range of tobacco advertising exposure channels, including gas stations/convenience stores, newspapers/magazines, and websites/social media sites.<sup>30</sup> Respondents exposed to any type of advertising at any place were considered having tobacco advertising exposure in the past month (Yes/No).<sup>30</sup>

### **Statistical Analysis**

First, we used Pearson Chi-square tests to examine the respondent characteristics (Wave 4) by receiving product price promotions by product type (Wave 4.5). Second, we calculated the prevalence of product use progression among all respondents and among those who received the price promotions by product type (Wave 4.5). We also implemented

Pearson Chi-square tests to assess the associations between receiving price promotions and product use progression by product type (Wave 4.5). Lastly, we used multivariable logistic regression models to examine the associations between receiving price promotions and use progression by product type (Wave 4.5), controlling for covariates (Wave 4). We applied the recommended youth/parent-Wave 4 cohort single-wave weights for analyzing Waves 4 and 4.5 longitudinal data.<sup>26</sup> Applying those weights also allowed us to adopt the balanced repeated replications method with a Fay adjustment of 0.3.<sup>26</sup> To minimize missing data, we used imputed demographic variables and derived tobacco use variables included in the PATH public use data files<sup>26</sup> and used an “undetermined” category for measures with missing values larger than 5% of the sample. For the regression models, we used listwise deletion because missing data were minimal across all variables used for the analysis (<1%). We conducted the statistical analyses using Stata 16.0 (Stata Corp, College Station, TX) with a statistical significance of 0.05. This research involved the use of de-identified data, which is not considered human subject research and requires no Institutional Review Board review per National Institutes of Health policy and 45 CFR 46.

## RESULTS

### Respondent Characteristics by Receiving Price Promotions

The analytical sample of respondents (Table 1) was balanced on biological sex (female: 49.7%; male: 50.3%) but had a higher portion of younger youth (12–14 years: 65.1%; 15–17: 34.9%). The prevalence of price promotion receipt in the past 12 months (Figure 2) was 5.4%, 3.8%, 3.1%, and 0.9% for any tobacco products, cigarettes, e-cigarettes, and cigars, respectively. Youth never tobacco users who had past-year internalizing and externalizing problems, lived with tobacco users, had at least one best friend using tobacco, and had past-month exposure to tobacco advertising were generally more likely to report receiving any tobacco price promotions and each product type of price promotions about one year later ( $p<0.05$ ).

### Prevalence of Tobacco Product Use Progression

Figure 2 shows the prevalence of tobacco use outcomes among all respondents and those who received product price promotions in the past year. Over the one-year period, 9.4%, 1.8%, 7.8%, and 0.9% of respondents initiated any tobacco products, cigarettes, e-cigarettes, and cigars, respectively; 4.2%, 0.7%, 3.4%, and 0.3% currently used any tobacco products, cigarettes, e-cigarettes, and cigars, respectively; and 1.6%, 0.3%, 1.2%, and 0.1% had ever used any tobacco products, cigarettes, e-cigarettes, and cigars regularly before, respectively. Chi-square test results show that receiving any tobacco product price promotions was also associated with all stages of any product use progression ( $p<0.01$ ), and receiving e-cigarette price promotions was associated with all stages of e-cigarette use progression ( $p<0.001$ ).

### Associations Between Receiving Product Price Promotions and Use Progression

Table 2 shows the results from the multivariable logistic regressions for assessing the associations between receiving product price promotions and product use progression by product type, adjusting for covariates. Receiving any tobacco product price promotions was associated with any product initiation (AOR=1.77, 95% CI=1.30, 2.41,  $p<0.001$ ), current

use (AOR=1.54, 95% CI=1.06, 2.23,  $p=0.022$ ), and ever regular use (AOR=1.76, 95% CI=1.04, 3.10,  $p=0.047$ ). Receiving e-cigarette price promotions was also associated with more progressed e-cigarette use outcomes, including current use (AOR=1.88, 95% CI=1.17, 3.02,  $p=0.009$ ), ever regular use (AOR=2.10, 95% CI=1.02, 4.40,  $p=0.048$ ). An overall pattern of product-specific associations was also found for initiating cigarettes and cigar products. Specifically, receiving price promotions for cigarettes and cigars were respectively associated with initiating cigarettes (AOR=2.39, 95% CI=1.44, 3.97,  $p=0.001$ ) and cigars (AOR=7.36, 95% CI=2.50, 12.89,  $p<0.001$ ). Product-specific associations were not found for current use or ever regular use of cigarettes and cigar products.

## DISCUSSION

This is one of the first studies to examine the association between receiving tobacco product-specific price promotions and corresponding product use progression among tobacco-naïve youth. The results highlighted the high rates of any tobacco (9.4%) and e-cigarette (7.8%) initiation between 2017 and 2018 and showed that receiving any tobacco product price promotions was associated with any product use progression outcomes over the past year. Additionally, this study revealed the positive associations between receiving e-cigarette price promotions and all stages of e-cigarette use progression, as well as the associations between receiving cigarette and cigar price promotions and corresponding product initiation. The analyses controlled for youth's overall tobacco advertising exposure, suggesting the independent associations between receiving price promotions and the use progression of the examined tobacco products.

Our study demonstrated that receiving tobacco price promotions, a marketing strategy pervasively used by tobacco companies,<sup>10</sup> may play an important role in youth's increased tobacco use. Tobacco price promotions may contribute to tobacco initiation by prompting youth's spontaneous tobacco purchasing and trial. The affordable prices and bundled sales through price promotions may also help sustain youth's escalated craving and increased consumption of tobacco products over time. The observed associations may also be explained by the formation of tobacco brand loyalty through youth's repeated exposure to price promotion tactics associated with certain tobacco brands. Previous research has shown that brand loyalty may contribute directly to increased purchasing of tobacco products and escalated long-term use.<sup>22,31</sup>

This study also found that receiving e-cigarette price promotions was associated with all stages of e-cigarette use progression among tobacco-naïve youth. This finding generally aligns with previous research that shows reduced e-cigarette prices (regardless through price promotion strategies or not) may increase youth e-cigarette use as this group is sensitive to price changes.<sup>32-34</sup> Additionally, in recent years, youth have become increasingly likely to receive and influenced by e-cigarette marketing messages through online platforms as opposed to traditional media (magazines and television).<sup>31,35,36</sup> Through these platforms that market e-cigarettes, youth may be exposed to a ubiquitous offering of price promotion tactics such as price discounts, bundled sales for reduced prices, and "buy one get one free"<sup>11,14,37</sup> In particular, social media influencers who promote e-cigarettes with discounted prices or promotion codes may attract youth to follow e-cigarette-related online content



and potentially become exposed to an increased amount of pro-e-cigarette messages over time.<sup>38,39</sup> This may conceivably contribute to youth's increased curiosity and intention of using e-cigarettes as well as impulse purchasing and opportunistic product use. Moreover, research has identified the growing use of e-cigarette price promotions at brick-and-mortar points of sale,<sup>40,41</sup> which further exposes tobacco naïve-youth to tobacco price promotion messages as they go about their daily activities. Finally, certain prominent e-cigarette brands, such as JUUL, adopted aggressive pricing strategies to lower the barrier for youth initiation and continued use by substantially reducing their prices of e-cigarette devices (e.g., 40% off for JUUL starter kits).<sup>42,43</sup> As a consequence, JUUL was reported to be the usual e-cigarette brand by more than half of current youth e-cigarette users,<sup>44</sup> suggesting that the observed associations for current and ever regular e-cigarette users may be influenced by users' loyalty towards certain brands.

This study also demonstrated that receiving price promotions for cigarettes was only associated with youth's cigarette initiation as opposed to more progressed outcomes. This finding runs counter to previous research showing that cigarette smoking experimentation among youth may be price-insensitive due to sparse consumption, whereas consistent smoking may be more sensitive to product price.<sup>45</sup> This inconsistency may be related to the small sample sizes from the low prevalence of current and ever regular cigarette smoking over one year. Alternatively, this may reflect the fact that marketing practices and sales for conventional cigarettes, including those through traditional and online media and tobacco retailers, are heavily regulated and restricted,<sup>37,46</sup> making it difficult for youth to receive or redeem cigarette price promotions for consistent use. Widespread anti-cigarette smoking social norms may also have counteracted the influence of any cigarette marketing messages received by youth.<sup>47</sup>

Furthermore, this study identified a relationship between receiving cigar price promotions and cigar initiation. Previous evidence has shown that cigar price discounts were ubiquitously found in cigar advertising and packaging on cigar sales websites, social media, print media, and points of sale.<sup>48,49</sup> Due to the affordability of many cigarillo and little cigar brands,<sup>50</sup> cigar smokers may be more price-sensitive than users of other tobacco products. This may partially explain why the effect size for the association between receiving price promotions and product initiation is the largest for cigar products, as compared to those for e-cigarettes and cigarettes.

This current study has several limitations. First, due to the PATH Study's measure of receiving price promotions in the past year, we examined the associations between receiving tobacco product price promotions and behavior change at Wave 4.5. Therefore, although we restricted the analytical sample to those who had never used tobacco at Wave 4, it is possible that youth had initiated tobacco prior to receiving price promotions within the one-year period. Second, the PATH Study only included questions about receiving price promotions. Future research aimed at gaining an in-depth understanding of the influence of tobacco price promotions is warranted to examine seeing, receiving, and using tobacco price promotions through various venues such as websites, social media, and physical retailers. Finally, this study did not examine the product-specific associations for other types of tobacco products (e.g., smokeless tobacco) because, according to the current analysis, the prevalence of

receiving price promotions for those products and using these products were comparatively lower than those for cigarettes, e-cigarettes, and cigars.

The current state and evolving pattern of tobacco price promotion strategies through social media and other online platforms should be continuously monitored. If warranted by evidence of product promotion effects on youth tobacco use, these promotional efforts should be further intervened. Unlike other countries such as the U.K. and Canada,<sup>51</sup> the U.S. currently does not have a national-level regulation for restricting the distribution or redemption of tobacco price promotions. Some U.S. states (e.g., New York and New Jersey), however, have recently passed laws to restrict retailers' use of price promotions for selling tobacco products.<sup>52,53</sup> Research is needed to assess the impact of those policy initiatives to inform tobacco price promotion regulations in the country. Enforcing the disclosure of industry sponsoring on social media<sup>54</sup> may be a promising strategy to reduce the appeal of hidden price promotion messages. Regulations that restrict cigars' multipack savings<sup>55</sup> may be especially effective in reducing cigar initiation.

## CONCLUSIONS

This nationally representative survey study among youth never tobacco users found significant associations between receiving price promotions (2016–2018) and use progression of any tobacco over one year (2017–2018). The product-specific associations were also found for all stages of e-cigarette use progression and cigarette and cigar initiation. This evidence adds to a growing body of work suggesting a need to continue monitoring various media platforms and retailers that marketing tobacco products, especially e-cigarettes, through price promotions.

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**What This Paper Adds:**

- Tobacco price promotions may prompt tobacco product trial among price-sensitive populations such as youth.
- Few studies are available assessing whether receiving price promotions for cigarettes, e-cigarettes, and cigars is associated with use progression of these products among youth.
- This study found that receiving any tobacco product promotions was associated with the progression of any tobacco use (including initiation, current use, and ever regular use).
- Receiving product promotions for e-cigarettes was associated with e-cigarette product use progression.
- Receiving price promotions for cigarettes and cigars was respectively associated with cigarette and cigar product initiation.

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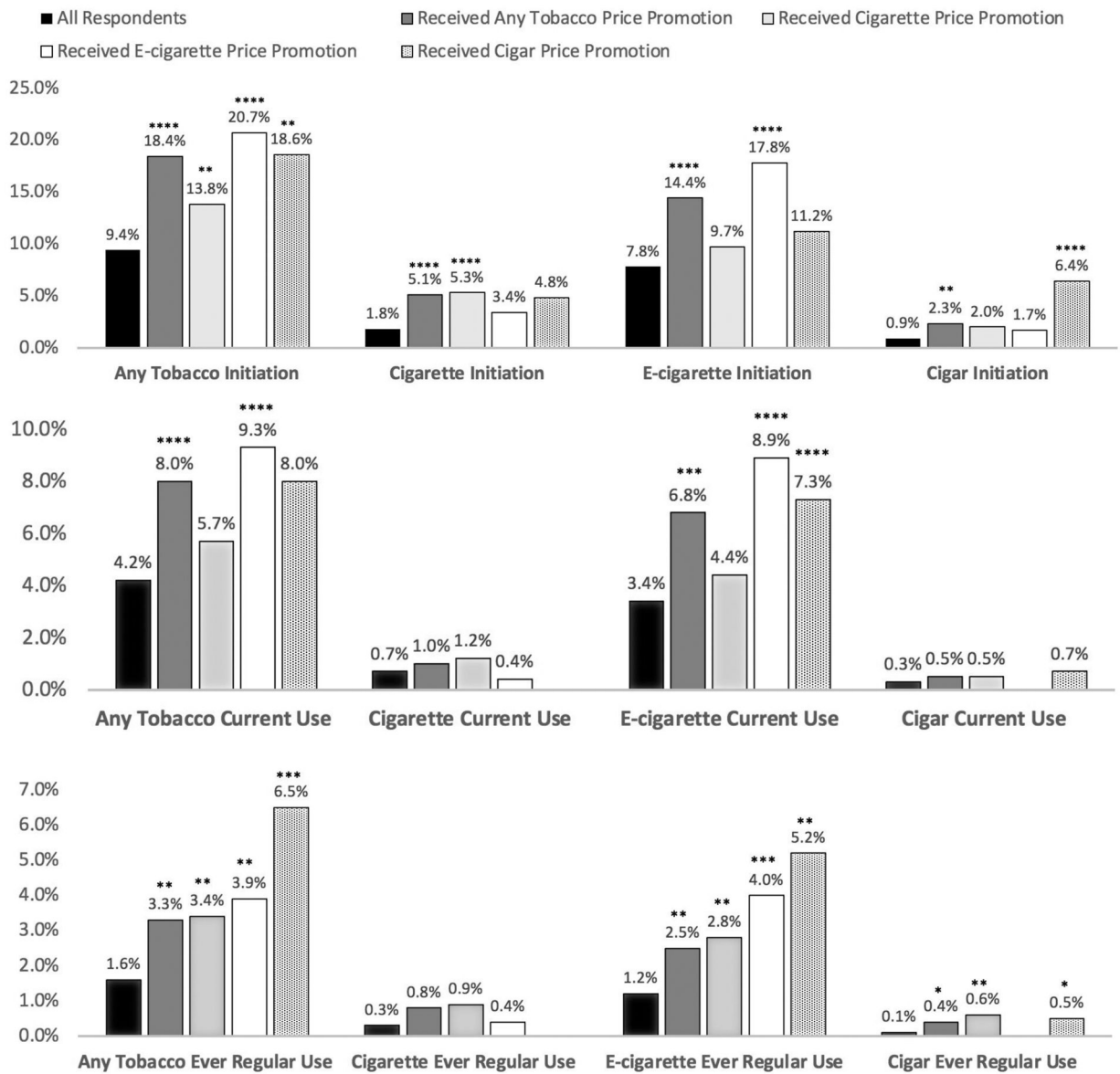
The figure displays three distinct advertisements. The leftmost advertisement is for JUUL, featuring a black warning banner at the top, the JUUL logo, navigation links, images of JUUL pods and a device, a large "\$20 OFF STARTER KIT\*" offer, and a "SHOP NOW" button. The middle advertisement is for Camel Crush, showing a globe with Camel Crush cigarette packs, the headline "CRUSH HAS A REFRESHED LOOK", and a "\$1.50 OFF A PACK OF CAMEL CIGARETTES" offer. The rightmost advertisement is for Swisher Sweets, showcasing a pack of Cigarillos, a "SAVE \$100" offer, and a "WEEKLY MOBILE COUPONS" section.

**Advertisement 1 (Left):** JUUL. **WARNING: This product contains nicotine. Nicotine is an addictive chemical.** SHOP DEVICES | SHOP JUULPODS | SUBSCRIBE & SAVE | STORE FINDER. **\$20 OFF STARTER KIT\***. For a limited time, you can purchase a JUUL starter kit at a discounted rate. The JUUL starter kit includes a JUUL device, USB charging dock, and four JUULpods in 5% nicotine strength (Virginia Tobacco, Mint, Creme, and Mango). **SHOP NOW**. \*Listed price reflects \$20 off.

**Advertisement 2 (Middle):** CRUSH HAS A REFRESHED LOOK. **\$1.50 OFF A PACK OF CAMEL CIGARETTES**. WEEKLY MOBILE COUPONS. Claim now with your smartphone at Camel.com™. EXPLORE CRUSH.

**Advertisement 3 (Right):** SAVE ON 2 CIGARS. SWISHER SWEETS. LIMITED EDITION STICKY SWEETS. CARAMEL PEACH. Finest 2 Quality CIGARILLOS. SMOOTH SWEET SATISFYING. SWISHERSWEETS.COM. **SAVE \$100** ON 2 PACKS OF SWISHER SWEETS CIGARILLOS! **SAVE \$100** ON 2 PACKS OF SWISHER SWEETS CIGARILLOS!

**Figure 1.** Examples of E-cigarette, Cigarette, and Cigar Product Advertisements Containing Price Promotions, 2017—2018 (Source: <https://www.trinketsandtrash.org/>)



**Figure 2.** Weighted Percentages of Tobacco Use Progression by Receiving Tobacco Price Promotions at Wave 4.5 among Never Tobacco Users Aged 12 to 16 at Wave 4: Population Assessment of Tobacco and Health Study Youth Surveys Waves 4 (2016–2018) and 4.5 (2017–2018; n= 9,405)<sup>1–3</sup>

1. Percentages are weighted estimates.
2. Zero percentages were not shown.
3. Chi-square test results for the associations between exposure to tobacco price promotions and tobacco use progression by product type (\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ ).



Table 1.

Respondent Characteristics and Receiving Price Promotions of Any Tobacco, Cigarettes, E-cigarettes, and Cigars at Wave 4.5 among Never Tobacco Users Aged 12 to 16 at Wave 4: Population Assessment of Tobacco and Health Study Youth Surveys Waves 4 (2016–2018) and 4.5 (2017–2018; n=9,405)<sup>1</sup>

	All Respondents		Any Tobacco Price Promotions		Cigarette Price Promotions		E-cigarette Price Promotions		Cigar Price Promotions	
	N (%)	N (%)	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>
Sample size	9,405 (100.0%)	496 (5.4%)	359 (3.8%)		269 (3.1%)		85 (0.9%)			
Age				<b>0.029</b>		<b>0.027</b>		0.149		0.690
12–14	6,114 (65.1%)	<b>345 (5.8%)</b>	<b>253 (4.1%)</b>		186 (3.3%)		57 (1.0%)			
15–17	3,291 (34.9%)	<b>151 (4.7%)</b>	<b>106 (3.2%)</b>		83 (2.7%)		28 (0.8%)			
Gender				0.148		0.151		0.210		0.938
Female	4,576 (49.7%)	257 (5.0%)	188 (3.5%)		141 (2.8%)		44 (0.9%)			
Male	4,829 (50.3%)	239 (5.8%)	171 (4.0%)		128 (3.4%)		41 (0.9%)			
Race/ethnicity				<b>0.001</b>		<b>0.006</b>		< <b>0.001</b>		0.284
Non-Hispanic White	4,285 (51.8%)	<b>261 (6.2%)</b>	<b>185 (4.2%)</b>		154 (3.7%)		47 (1.1%)			
Non-Hispanic Black	1,326 (14.0%)	<b>68 (5.4%)</b>	<b>53 (4.0%)</b>		24 (2.0%)		11 (0.9%)			
Hispanic	2,879 (23.8%)	<b>115 (4.1%)</b>	<b>80 (2.7%)</b>		63 (2.3%)		22 (0.8%)			
Non-Hispanic Other	915 (10.4%)	<b>52 (5.1%)</b>	<b>41 (3.8%)</b>		28 (3.2%)		5 (0.4%)			
Highest Level of Parental Education				0.537		0.607		<b>0.036</b>		0.993
<HS/GED	992 (8.3%)	43 (4.4%)	35 (3.6%)		17 (1.8%)		8 (0.8%)			
HS/GED	1,526 (15.3%)	77 (4.9%)	63 (4.0%)		35 (2.3%)		15 (1.1%)			
Some College	1,594 (17.1%)	93 (5.9%)	68 (4.3%)		50 (3.3%)		14 (0.8%)			
>Bachelor	2,473 (29.9%)	129 (5.4%)	84 (3.3%)		86 (3.7%)		22 (0.8%)			
Undetermined	2,820 (29.4%)	154 (5.8%)	109 (4.0%)		81 (3.2%)		26 (1.1%)			
Annual Household Income				0.247		0.197		<b>0.003</b>		0.454
\$24,999	2,131 (22.7%)	105 (5.1%)	84 (4.0%)		42 (2.0%)		21 (1.1%)			
\$25,000–\$49,999	2,042 (21.7%)	96 (5.3%)	72 (3.8%)		47 (2.7%)		12 (0.7%)			
\$50,000–\$99,999	2,272 (24.2%)	138 (6.0%)	104 (4.4%)		75 (3.4%)		20 (0.9%)			
\$100,000	2,477 (26.3%)	135 (5.6%)	84 (3.3%)		96 (4.0%)		26 (1.0%)			
Undetermined	483 (5.1%)	22 (3.9%)	15 (2.9%)		9 (1.6%)		6 (0.9%)			
Past-year Internalized Problems				< <b>0.001</b>		< <b>0.001</b>		< <b>0.001</b>		<b>0.013</b>

	All Respondents		Any Tobacco Price Promotions		Cigarette Price Promotions		E-cigarette Price Promotions		Cigar Price Promotions	
	N (%)	N (%)	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>	N (%)	P-value <sup>2,3</sup>
Yes	5,976 (64.3%)	<b>389 (6.7%)</b>	<b>281 (4.6%)</b>		217 (3.9%)		<b>65 (1.1%)</b>			
No	3,429 (35.7%)	<b>107 (3.2%)</b>	<b>78 (2.3%)</b>		52 (1.6%)		<b>20 (0.6%)</b>			
Past-year Externalized Problems				<0.001		<0.001		<0.001		<b>0.029</b>
Yes	6,744 (72.6%)	<b>418 (6.4%)</b>	<b>305 (4.5%)</b>		231 (3.7%)		<b>70 (1.0%)</b>			
No	2,661 (27.4%)	<b>78 (3.0%)</b>	<b>54 (2.0%)</b>		38 (1.6%)		<b>15 (0.6%)</b>			
Living with Tobacco Users				<0.001		<0.001		<0.001		<b>0.030</b>
Yes	2,559 (27.1%)	<b>218 (8.6%)</b>	<b>172 (6.5%)</b>		102 (4.3%)		<b>32 (1.3%)</b>			
No	6,846 (72.9%)	<b>278 (4.3%)</b>	<b>187 (2.8%)</b>		167 (2.7%)		<b>53 (0.8%)</b>			
Best Friend(s) Using Tobacco				<0.001		<b>0.001</b>		<0.001		0.071
Yes	1,916 (20.2%)	<b>145 (8.6%)</b>	<b>98 (5.1%)</b>		88 (5.1%)		24 (1.3%)			
No	7,389 (79.8%)	<b>351 (4.3%)</b>	<b>261 (3.4%)</b>		181 (2.6%)		61 (0.9%)			
Past-Month Any Tobacco Advertising Exposure <sup>4</sup>				<0.001		<0.001		<0.001		<0.001
Yes	6,121 (66.0%)	<b>413 (7.0%)</b>	<b>300 (4.8%)</b>		238 (4.2%)		<b>69 (1.2%)</b>			
No	3,284 (34.0%)	<b>83 (2.5%)</b>	<b>59 (1.8%)</b>		31 (0.9%)		<b>16 (0.5%)</b>			

<sup>1</sup> Percentages are weighted estimates.

<sup>2</sup> Bolded text represents  $p < 0.05$ .

<sup>3</sup> P-value for testing group difference.

<sup>4</sup> Advertising of any tobacco products including e-cigarettes, cigarettes, and other tobacco products.

Table 2.

Associations Between Receiving Price Promotions and Use Progression of Any Tobacco, Cigarettes, E-cigarettes, and Cigars at Wave 4.5 among Never Tobacco Users Aged 12 to 16 at Wave 4: Population Assessment of Tobacco and Health Study Youth Surveys Waves 4 (2016–2018) and 4.5 (2017–2018); n= 9,405<sup>1</sup>

	Any Tobacco Price Promotions			Cigarette Price Promotions			E-cigarette Price Promotions			Cigar Price Promotions		
	AOR (95% CI)	P-value <sup>2</sup>	P-value <sup>2</sup>	AOR (95% CI)	P-value <sup>2</sup>	P-value <sup>2</sup>	AOR (95% CI)	P-value <sup>2</sup>	P-value <sup>2</sup>	AOR (95% CI)	P-value <sup>2</sup>	P-value <sup>2</sup>
<b>Product Initiation</b>												
Any Tobacco Initiation	<b>1.77 (1.30, 2.41)</b>	<0.001	0.335	1.21 (0.82, 1.77)	0.001	0.335	<b>1.87 (1.24, 2.81)</b>	0.003	0.003	1.85 (0.90, 3.81)	0.093	0.093
Cigarette Initiation	<b>2.45 (1.56, 3.86)</b>	<0.001	<b>0.001</b>	<b>2.39 (1.44, 3.97)</b>	<b>0.001</b>	<b>0.001</b>	1.52 (0.65, 3.52)	0.327	0.327	2.14 (0.60, 7.61)	0.235	0.235
E-cigarette Initiation	<b>1.55 (1.10, 2.18)</b>	<b>0.012</b>	0.873	0.96 (0.60, 1.55)	0.873	0.873	<b>1.78 (1.18, 2.67)</b>	<b>0.006</b>	<b>0.006</b>	1.18 (0.48, 2.89)	0.709	0.709
Cigar Initiation	<b>2.17 (1.07, 4.40)</b>	<b>0.032</b>	0.289	1.72 (0.63, 4.72)	0.289	0.289	1.45 (0.46, 4.50)	0.521	0.521	<b>7.36 (2.50, 12.89)</b>	<0.001	<0.001
<b>Product Current Use</b>												
Any Tobacco Current Use	<b>1.54 (1.06, 2.23)</b>	<b>0.022</b>	0.988	1.07 (0.64, 1.77)	0.988	0.988	<b>1.62 (1.02, 2.58)</b>	<b>0.117</b>	<b>0.117</b>	1.65 (0.65, 4.22)	0.292	0.292
Cigarette Current Use	0.92 (0.31, 2.74)	0.882	0.987	0.99 (0.26, 3.80)	0.987	0.987	0.33 (0.03, 4.03)	0.380	0.380	---	---	---
E-cigarette Current Use	<b>1.63 (1.06, 2.50)</b>	<b>0.026</b>	0.841	1.07 (0.56, 2.02)	0.841	0.841	<b>1.88 (1.17, 3.02)</b>	<b>0.009</b>	<b>0.009</b>	1.87 (0.68, 5.19)	0.225	0.225
Cigar Current Use	0.88 (0.11, 7.01)	0.906	0.928	0.90 (0.06, 14.1)	0.928	0.928	---	---	---	1.64 (0.11, 5.12)	0.718	0.718
<b>Product Ever Regular Use</b>												
Any Tobacco Ever Regular Use	<b>1.76 (1.04, 3.10)</b>	<b>0.047</b>	0.096	1.81 (0.90, 3.65)	0.096	0.096	1.84 (0.91, 3.75)	0.091	0.091	<b>3.58 (1.21, 10.57)</b>	<b>0.022</b>	<b>0.022</b>
Cigarette Ever Regular Use	1.75 (0.42, 6.78)	0.415	0.585	1.61 (0.29, 8.99)	0.585	0.585	0.84 (0.06, 11.30)	0.893	0.893	---	---	---
E-cigarette Ever Regular Use	1.65 (0.84, 3.25)	0.144	0.089	2.02 (0.90, 4.54)	0.089	0.089	<b>2.10 (1.02, 4.40)</b>	<b>0.048</b>	<b>0.048</b>	3.50 (0.95, 12.80)	0.059	0.059
Cigar Ever Regular Use	---	---	---	---	---	---	---	---	---	---	---	---

<sup>1</sup>The results are from multivariable logistic regression models controlling for age, gender, race/ethnicity, parental education, annual household income, past-year internalized problems, living with tobacco users, having at least one best friend using tobacco, and past-month tobacco advertising exposure.

<sup>2</sup>Bolded text represents  $p < 0.05$ .

<sup>3</sup>Regression models were unable to execute due to insufficient observations to compute BRR standard errors.