

Associations Between Exposure and Receptivity to Branded Cigarette Advertising and Subsequent Brand Preference Among US Young Adults

Meghan Bridgid Moran PhD¹, Samir Soneji PhD², Andy S. L. Tan PhD^{3,4,○}, Kelvin Choi PhD⁵

¹Department of Health, Behavior, and Society, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD; ²Geisel School of Medicine at Dartmouth, The Dartmouth Institute for Health Policy & Clinical Practice, Lebanon, NH; ³Center for Community-Based Research, McGraw/Patterson Division of Population Sciences, Dana-Farber Cancer Institute, Boston, MA and ⁴Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA; ⁵Division of Intramural Research, National Institute on Minority Health and Health Disparities, Bethesda, MD

Corresponding Author: Meghan Bridgid Moran, PhD, Department of Health, Behavior, and Society, Bloomberg School of Public Health, Johns Hopkins University, 624 North Broadway, Hampton House, Baltimore, MD 21205, USA. Telephone: 410-614-6872; E-mail: mmoran22@jhu.edu

Abstract

Introduction: Exposure and receptivity to cigarette advertising are well-established predictors of cigarette use overall. However, less is known about whether exposure and receptivity to advertising for specific brands of cigarettes (ie, Marlboro, Camel, and Newport) are longitudinally associated with any subsequent cigarette use and subsequent use of those specific brands.

Methods: We analyzed data from a US sample of 7325 young adults aged 18–24 years who completed both Wave 1 and Wave 2 of the Population Assessment of Tobacco and Health study. Weighted logistic regression models were used to examine (1) among Wave 1 never-smokers, associations between Wave 1 exposure and receptivity to advertising for Marlboro, Camel, and Newport and subsequent overall and brand-specific smoking initiation at Wave 2, and (2) among Wave 1 ever-smokers, associations between Wave 1 exposure and receptivity to advertising for Marlboro, Camel, and Newport and subsequent preference of those brands at Wave 2.

Results: Among Wave 1 young-adult never-smokers, exposure to Camel advertising, but not Marlboro or Newport, was associated with smoking initiation with any brand of cigarettes at Wave 2. Among Wave 1 young-adult ever-smokers, receptivity to Marlboro, Camel, and Newport advertising was associated with subsequent preference for each brand, respectively, at Wave 2.

Conclusions: This study found evidence for the association between receptivity to branded cigarette marketing and subsequent use of that brand. These findings provide evidence regarding the pathways through which cigarette marketing attracts young adults to use cigarettes and can inform tobacco prevention and counter-marketing efforts.

Implications: This study extends prior work on the effects of cigarette advertising exposure and receptivity by illustrating the brand specificity of this advertising. These findings provide evidence that receptivity to branded cigarette advertising is longitudinally associated with preference for those specific cigarette brands.

Introduction

Cigarette advertising is causally linked to cigarette use.¹⁻⁴ Although many forms of cigarette advertising are restricted in the United States (eg, televised ads, ads less than 1000 feet from schools and playgrounds), others are still allowed (eg, retail environments, store-fronts).⁵ Exposure to advertising can cultivate positive response to the advertisements (known as receptivity to advertising).^{4,6} Previous studies have established a robust association between both exposure and receptivity to cigarette advertising and smoking initiation among youth.^{2,7} One reason this occurs is because the advertising normalizes product use and creates openness to use of cigarettes use in general.^{4,8} However, this association has rarely been examined among young adults—a key age group, as the average age of smoking initiation in the United States is approximately 18 years⁹ and young adults are the age group most likely to initiate tobacco use.⁹⁻¹¹

Furthermore, little is known about whether receptivity to advertising for a specific brand is associated with subsequent smoking. Tobacco companies cultivate receptivity by creating advertising that appeals to specific subgroups and drive consumption of specific brands or sub-brands.¹² These advertisements could increase brand-specific receptivity and create a sense of brand loyalty and preference for a specific brand.¹³

We hypothesize that, among young adults, (1) exposure to advertising for Marlboro, Camel, and Newport cigarettes at baseline will be associated with never-smokers initiating smoking with any brand of cigarettes, and (2) receptivity to advertising for Marlboro, Camel, and Newport cigarettes at baseline will be associated with subsequent use of the brand in question. We focus on these brands because they are the three most widely used cigarette brands among US adults and are especially preferred by young adults.^{14,15} Findings from this study will expand our understanding of receptivity to tobacco advertising and tobacco-use initiation among young adults, and the role of brand-specific receptivity on brand preferences.

Methods

Sample

We used data from Waves 1 and 2 of the Population Assessment of Tobacco and Health (PATH) study. The PATH Study is a longitudinal cohort study conducted in the United States, designed to provide evidence to inform and monitor US Food and Drug Administration tobacco regulatory action. Wave 1 (W1) was conducted between September 2013 and December 2014, and Wave 2 (W2) was conducted between October 2014 and October 2015. The PATH study employed a four-stage stratified area probability design; full details are available in Hyland et al.¹⁶ The sample for this study was restricted to 7325 individuals aged 18–24 years at W1 who also completed W2 of the study.

Measures

W2 Smoking Status and Brand Preference

Among W1 never-smokers (had never tried a cigarette at W1), our primary outcome of interest was ever cigarette use at W2, regardless of brand. This was assessed using a variable indicating whether the participant had ever tried smoking cigarettes at W2. Among W1 ever-smokers (had ever tried a cigarette at W1), we created three variables indicating preference for (1) Marlboro (vs. any non-Marlboro brand or no usual brand), (2) Camel (vs. any non-Camel brand or no usual

brand), and (3) Newport (vs. any non-Newport brand or no usual brand). Individuals who had smoked greater than 100 cigarettes in their life, and who had smoked in the past 30 days were asked if they had a usual brand of cigarettes. Those who answered yes were asked what that brand was. Participants could select only one brand. For example, participants who answered that they had a usual brand of cigarettes and that the brand was Marlboro were coded as preferring Marlboro cigarettes (“1”); those who either answered they did not have a usual brand or that their usual brand was a non-Marlboro brand were coded as not having a preference for Marlboro (“0”).

W1 Exposure and Receptivity to Cigarette Marlboro, Camel, and Newport Advertising

We adapted the general measure of tobacco marketing receptivity by Pierce et al.⁶ to create three brand-specific measures of exposure and receptivity. Participants were first asked to name the brand of their favorite tobacco advertisement. Participants were then shown a cigarette advertisement for Marlboro, Camel, and Newport, randomly selected from a larger pool of ads, and asked if they had seen the advertisement before, and if they liked the advertisement. The advertisement was displayed simultaneously with the questions and stayed on the screen until participants moved to the next set of questions. These items were used to create a three-level variable for each brand. Participants who had neither seen, liked, nor had a favorite advertisement for a specific brand received a score of “0” indicating no exposure or receptivity. Participants who had seen the advertisement for a specific brand but did not like or have a favorite advertisement for that brand received a score of “1” indicating exposure, but no receptivity. Participants who reported liking the ad or that their favorite tobacco advertisement was for that brand received a score of “2” indicating receptivity to advertising for that brand. Although participants are asked to report exposure to and liking of a specific advertisement, coupled with the “favorite advertisement” item, this measure of receptivity is meant to indicate overall exposure and receptivity to the brand’s advertising (not just receptivity to one specific advertisement).

Analysis

Among W1 never-smokers ($N = 2584$), we used logistic regression to examine whether exposure and receptivity to advertising for each brand was associated with progression to ever smoking at W2. We focused on ever smoking among this group because very few W1 never-smokers had developed brand preference by W2. Among W1 ever-smokers, we used logistic regression to examine whether exposure and receptivity to advertising for each brand was associated with preference for each brand (compared to no or other brand preference). For all analyses, the initial models contain only the three brand-specific exposure and receptivity variables (Marlboro, Camel, and Newport), and additional models included sociodemographics, living with a smoker, and time spent with a smoker in the past week (see Table 1). Listwise deletion was used for missing responses. All analyses were conducted using Stata Version 14 and used balanced repeated replication weights with Fay’s correction of 0.3.

Results

Table 1 presents participant characteristics overall and by W1 smoking status. Most W1 never-smokers did not progress to any smoking at W2. Most W1 never-smokers were neither exposed nor

Table 1. Characteristics of 18- to 24-Year-Old W1 (September 2013–December 2014) and W2 (October 2014–October 2015) PATH Study Participants, Overall and Stratified by W1 Smoking Status, United States

	Overall		W1 never-smoker		W1 ever-smoker	
	Weighted (%)	N	Weighted (%)	N	Weighted (%)	N
Gender						
Female	49.8	3696	54.8	1464	45.4	2232
Male	50.2	3629	45.2	1120	54.6	2506
Race/ethnicity						
Non-Hispanic white	55.0	3742	51.3	1196	58.2	2546
Non-Hispanic black	13.3	1159	15.8	520	11.1	638
Hispanic	20.7	1734	19.5	609	21.7	1124
Other non-Hispanic	11.1	690	13.4	259	9.0	430
Income						
<\$10 000	25.6	2067	23.9	670	27.0	1395
\$10 000–24-999	21.5	1682	18.4	486	24.2	1195
\$25 000–\$49 999	17.0	1222	17.2	441	16.8	781
\$50 000–\$99 999	14.2	944	15.1	368	13.4	576
>\$100 000	9.6	587	10.6	245	8.7	342
Missing	12.2	823	14.8	374	9.9	449
Education						
Less than high school	10.9	941	9.5	286	12.1	653
General Education Development or High school degree	32.4	2643	31.8	889	33.0	1753
Some college or associate's degree	43.0	2960	43.1	1085	42.9	1875
Bachelor's degree or more	13.1	744	14.9	308	11.6	436
Missing	0.5	37	0.6	16	0.4	21
Time spent with a smoker in past 7 days						
None	35.8	2188	52.2	1287	21.3	901
Any time	63.5	5078	47.4	1286	77.6	3789
Missing	0.7	59	0.4	11	1.0	48
Lives with a smoker						
No	68.3	4644	80.4	2048	57.6	2594
Yes	31.5	2658	19.5	530	42.1	2127
Missing	0.2	23	0.1	6	0.3	17
W1 smoking status						
Never-smoker	46.9	2584	100[-]	2584	—	0
Ever, non-Marlboro, Camel or Newport	35.9	3035	—	0	67.5	3035
Ever, Marlboro preference	9.3	882	—	0	17.5	882
Ever, Camel preference	3.9	374	—	0	7.2	374
Ever, Newport preference	4.1	447	—	0	7.8	447
Missing	0.0	3	—	0	—	0
W2 smoking status						
Never	43.6	2359	93.0	2359	—	0
Ever, non-Marlboro, Camel, or Newport	39.1	3251	6.2	200	68.2	3049
Ever, Marlboro preference	8.1	763	0.5	12	14.8	751
Ever, Camel preference	4.9	471	0.1	6	9.1	465
Ever, Newport preference	4.3	480	0.2	7	8.0	473
Missing	0.0	1	—	0	—	0
Marlboro exposure and receptivity						
No exposure or receptivity	72.2	5065	81.6	2093	64.0	2971
Exposed	13.6	1076	12.0	340	15.1	735
Receptive	13.7	1154	6.1	140	20.5	1013
Missing	0.5	30	0.4	11	0.5	19
Camel exposure and receptivity						
No exposure or receptivity	72.4	5075	80.1	2049	65.6	3025
Exposed	16.0	1269	13.6	371	18.2	897
Receptive	11.2	956	5.9	152	15.9	803
Missing	0.4	25	0.5	12	0.3	13
Newport exposure and receptivity						
No exposure or receptivity	77.3	5351	83.5	2093	71.8	3256
Exposed	14.1	1155	13.2	399	15.0	756
Receptive	8.3	801	3.0	85	13.0	715
Missing	0.3	18	0.3	7	0.3	11

Weighted prevalences in italics indicate cell sizes <50. The PATH User Guide notes that estimates for cell sizes below 50 may be statistically unreliable. — indicates that no participants are in the cell.

Table 2. Association Between Brand-Specific Exposure and Receptivity and Odds of Progression to Ever Smoking and Brand Preference for Marlboro, Camel, and Newport Among 18- to 24-year-old W1 (September 2013 to December 2014) and W2 (October 2014 to October 2015) PATH Study Participants, United States

	Progression to ever smoking, among W1 never-smokers ^a		Preference for Marlboro at W2, among W1 non-Marlboro smokers ^b		Preference for Camel at W2, among W1 non-Camel smokers ^b		Preference for Newport at W2, among W1 non-Newport smokers ^b	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Marlboro exposure and receptivity								
None (referent category)								
Exposed	1.22 (0.74 to 2.00)	1.03 (0.61 to 1.76)	1.24 (0.74 to 2.08)	0.94 (0.53 to 1.67)	1.36 (0.87 to 2.14)	1.19 (0.75 to 1.90)	0.75 (0.43 to 1.29)	0.88 (0.50 to 1.53)
Receptive	1.72 (0.87 to 3.38)	1.54 (0.74 to 3.21)	4.3*** (2.81 to 6.58)	3.47*** (2.18 to 5.50)	1.55** (1.14 to 2.12)	1.24 (0.86 to 1.77)	0.75 (0.40 to 1.41)	0.67 (0.36 to 1.24)
Camel exposure and receptivity								
None (referent category)								
Exposed	1.74* (1.14 to 2.67)	1.56 (0.95 to 2.56)	1.41 (0.99 to 2.02)	1.26 (0.88 to 1.81)	1.14 (0.71 to 1.83)	1.12 (0.70 to 1.79)	0.69 (0.41 to 1.16)	0.70 (0.41 to 1.19)
Receptive	1.28 (0.61 to 2.70)	1.29 (0.54 to 3.09)	1.33 (0.81 to 2.18)	0.97 (0.58 to 1.62)	2.50*** (1.68 to 3.73)	2.52 (1.7 to 3.74)***	0.34* (0.15 to 0.77)	0.48 (0.21 to 1.10)
Newport exposure and receptivity								
None (referent category)								
Exposed	0.88 (0.49 to 1.57)	0.81 (0.43 to 1.52)	0.98 (0.60 to 1.61)	1.29 (0.72 to 2.29)	0.93 (0.6 to 1.45)	1.07 (0.66 to 1.73)	3.76*** (2.01 to 7.03)	2.62** (1.26 to 5.48)
Receptive	1.03 (0.42 to 2.50)	1.14 (0.39 to 3.31)	0.73 (0.41 to 1.30)	1.04 (0.56 to 1.93)	1.08 (0.63 to 1.86)	1.11 (0.64 to 1.95)	17.84*** (11.01 to 28.91)***	11.52 (6.25 to 21.25)***

AOR = adjusted odds ratio; CI = confidence interval; OR = odds ratio. These analyses excluded those who were already smokers of each brand (eg, the analysis examining W2 preference for Marlboro excluded W1 Marlboro smokers). Thus, the analytic sample size examining the effect of Marlboro advertising exposure and receptivity on Marlboro preference was 3856; the analytic sample size examining the effect of Camel advertising exposure and receptivity on Camel preference was 4364; and the analytic sample size examining the effect of Newport advertising exposure and receptivity on Newport preference was 4291. Bold values indicate statistical significance at or below $p < .05$ threshold.

* $p < .05$, ** $p < .01$, *** $p < .001$.

^aReference category is never smoking.

^bReference category is preferring another brand or having no brand preference.

receptive to advertising for any of the three brands. More W1 ever-smokers reported exposure or receptivity.

Table 2 displays results of the logistic regression analyses. W1 ever-smokers who were receptive to Marlboro advertising at W1 were more than three times more likely to prefer Marlboro cigarettes compared to another brand or no brand preference at W2. In the unadjusted model, receptivity to Marlboro advertising was also associated with an increased likelihood of preference for Camel cigarettes at W2. Exposure to Camel advertising was associated with an increased likelihood of progressing to ever smoking at W2 among W1 never-smokers in the unadjusted model only, whereas receptivity to Camel advertising was associated with an increased likelihood of preferring Camel cigarettes among W1 ever-smokers. In the unadjusted model, receptivity to Camel advertising was associated with a decreased likelihood of preference for Newport cigarettes at W2. Ever-smokers who were exposed to Newport advertising were more than two times more likely to prefer Newport at W2, and those who were receptive to Newport advertising at W1 were more than 11 times more likely to prefer Newport cigarettes at W2, in both the unadjusted and adjusted models. However, the large confidence intervals for the association between receptivity and subsequent use indicate these findings should be interpreted with caution. Supplementary Table 1 presents results of a sensitivity analysis controlling for overall receptivity to tobacco marketing.

Discussion

This study extends prior work on the effects of overall cigarette advertising exposure and receptivity on tobacco use^{4,6} by illustrating the brand-specificity of this advertising. Although others¹⁷ have found cross-sectional correspondence between the cigarette brands commonly smoked by youth and the brands commonly named as favorite advertisement, this study's findings suggest exposure and receptivity to branded cigarette advertising are longitudinally associated with preference for those specific brands. In addition, our findings indicate that exposure to Camel advertising may prompt a general sense of openness to smoking, but more research should explore this association. These findings illustrate that exposure and receptivity to cigarette advertising may drive subsequent cigarette use by both increasing openness to smoking in general and by cultivating specific preference for the advertised brand.

Cigarette smokers tend to have high levels of brand loyalty^{18,19} and evaluate their preferred brand highly, even when they report negative feelings about the tobacco industry overall.²⁰ In general, brand loyalty enhances a brand's ability to engender increased purchasing among consumers, as well as a brand's ability to recover from negative publicity or other events²¹ One mechanism through which this occurs is defensive processing of information, such that consumers who are loyal to a particular brand are likely to discredit negative information about the brand while disproportionately weighting positive information.²¹ Notably, this type of defensive processing begins when a consumer first begins to like a brand. The ability of tobacco marketing to attract consumers to specific brands and engender loyalty to those brands could not only escalate intensity of use but also stifle efforts to discredit the tobacco industry or encourage cessation.

In the United States, like many other countries, tobacco companies are prohibited from advertising to youth under age 18 years. Although the effects of exposure to tobacco marketing on subsequent

tobacco use are well established, less work has focused on the specific advertising tactics that tobacco companies use to attract consumers to their brands. Historically, cigarette companies advertise products to appeal to specific consumer demographics.¹² Marlboro has a history of using masculinity and rugged, outdoors imagery whereas Newport has typically associated their product with fun and sexuality.^{12,22} Camel has targeted a young, hip market by associating their product with music festivals and avant-garde activities.²³ Future research should further examine the effects of the specific advertising strategies used to attract consumers. In addition, these findings can inform counter-marketing and prevention efforts. Because the tobacco industry typically targets marketing for different brands to different consumer segments with different psychographic profiles, similarly targeted counter-marketing messages could be delivered to those individuals who are receptive to marketing for a particular brand.

Limitations

Our measure of exposure and receptivity was developed to align with prior research using PATH survey data,^{4,6} but it may conservatively estimate levels of exposure and receptivity because it focused on exposure to and liking of specific ads. In addition, causality cannot be inferred from this study. Our analyses examining W2 brand preference excluded those who already preferred the brand at W1, and it is possible that PATH's measure of brand preference at W1 was not broad enough to capture all individuals who used or preferred a particular brand. For example, this measure did not account for use of two or more brands, nor did it account for brand preference among those who did not smoke 100 lifetime cigarettes. The receptivity and brand preference measures also do not allow us to account for brand subtype, and the potential effect of chemosensory characteristics such as menthol could not be specified. Although analyses were controlled for sociodemographics and exposure to others' smoking, there may be additional unobserved confounding variables that increase both likelihood of receptivity to branded advertising and subsequent use of that brand's cigarettes. For example, participants may have an unobserved preference for a certain brand that would predict both receptivity to and use of a specific brand. The large point estimates and wide confidence intervals for the association between Newport receptivity and subsequent Newport use indicate that these findings should be interpreted with caution. Further research is needed to confirm these findings. Moreover, while cigarette companies in other countries typically use branding to distinguish their product from others on the market,^{24,25} similar to US advertising, this study should be replicated in other countries.

Conclusions

Although previous research found overall receptivity was associated with progression to tobacco use, this study contributes new evidence that brand-specific exposure and receptivity are also associated with young adults' preference for certain brands of cigarettes. These findings underscore the need for research to monitor and examine effects of cigarette brands' advertising tactics and provide the evidence for counter-marketing interventions.

Supplementary Material

Supplementary data are available at *Nicotine and Tobacco Research* online.

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Declaration of Interests

MBM served as an expert witness for the prosecutor (Public Health Advocacy Institute) in litigation in which RJ Reynolds Tobacco Company was the defendant.

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