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### Title

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*A Policy Research Partnership  
to Reduce Youth Substance Use*

## **Association of Point of Purchase Tobacco Advertising and Promotions with Choice of Usual Brand Among Teenage Smokers**

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## **Abstract**

**Objectives** - To determine the relationship between brand-specific advertising and promotions in convenience stores for Marlboro and Camel cigarettes and choice of usual brand among school students.

**Design** - Cross-sectional survey with merged records of store tobacco advertising and promotions.

**Setting** – United States.

**Participants** – 3,890 high school smokers with a usual brand, matched to 196 convenience stores.

**Main outcome measures** – Choice of Marlboro as a usual brand ; choice of Camel as a usual brand.

**Results** – Choice of Marlboro as a usual brand was associated with presence of a Marlboro gift with purchase ( $p<.001$ ) and a greater brand share of interior ( $p=.05$ ) and exterior ( $p=.05$ ) advertising voice for Marlboro. Choice of Camel as a usual brand was associated with a greater share of interior advertising voice for Camel ( $p<.001$ ) but was unrelated to Camel gift with purchase promotions ( $p>.05$ ) and negatively associated with a greater share of exterior advertising voice for Camel ( $p<.001$ ).

**Conclusions** – The results are consistent with the notion that Marlboro-specific advertising and promotions may influence choice of Marlboro as a usual brand to smoke among teens, but results for Camel are mixed and inconclusive. Further research is required to confirm and extend these findings.

## **Introduction**

There is good evidence that tobacco advertising and promotions are implicated as catalysts in the initiation of smoking among teenagers. Tobacco advertising appeals to teenagers and is recalled by them (Arnett & Terhanian, 1998, Feighery et al., 1998; Pierce et al., 1991; DiFranza et al., 1991). Teenagers also have a high level of participation in tobacco promotions (Pierce et al, 1998; Biener & Siegel, 2000; Sargent et al, in press). Three longitudinal studies have demonstrated that those who own promotional items are more likely to go on to be smokers (Pierce et al, 1998; Biener & Siegel, 2000; Sargent et al., 2000), and there is a significant concordance between ownership of branded tobacco promotional items and the brand teenagers say they would chose if they did smoke (Sargent et al, in press). Redmond (1999) has shown that in years of high tobacco industry promotional expenditure, the rate of smoking initiation among US ninth graders was higher than expected.

Although there is clear evidence that tobacco advertising increases overall demand for cigarettes (Saffer & Chaloupka, 1999), tobacco companies have publicly maintained that the purpose of their advertising is only to promote and maintain choice of a particular brand of cigarettes. However, it is known that brand choices are usually made early during the life of a smoker, with a high concordance between the brand first smoked and the brand eventually selected as a usual brand (DiFranza et al., 1994). Tobacco company documents indicate that cigarette companies appreciate the significance of recruiting the young to their own brands (Pollay, 2000). Research demonstrates that young smokers are

about three times more sensitive to brand share of tobacco advertising than older smokers (Pollay et al., 1996), leading to the conclusion that competition between cigarette companies “seems predominated by the battle of brands for market share among the young” (p.1).

Given this background, the aim of the present study was to determine whether a higher prevalence of branded promotions and a higher brand share of advertising is associated with a higher prevalence of concordant brand choice among teenage smokers.

## **Methodology**

### Student sample selection

The data used for this study were from a survey of United States school students in grades 9 to 12 administered in the Spring of 1996. A three-stage sampling procedure was used, which over-sampled African American, Hispanic and high school students in low income areas. The primary sampling units were counties of the mainland United States and 100 counties were selected with probability proportional to population. In addition to this procedure, 100 additional counties were selected from a sampling frame of 40 counties most populated with African Americans, 40 most populated with Hispanic Americans and 20 most populated with low income earners, as signified by a median household income value of US\$15,000 or less. Within each selected primary sampling

unit, one school was selected with probability proportional to enrolment in grades 9 through 12. Four substitute schools were drawn within each of the 200 primary sampling units, so that they would match the selected school with respect to degree of urbanization, type and size of school, percent minority enrolment, and income level.

When a selected school declined to participate in the survey, one of the four substitutes associated with that school was contacted to attempt to gain participation. If cooperation of the first substitute school could not be gained, negotiations were begun with the second substitute school. There were some primary sampling units where selected schools could not be recruited into the study, as refusals sometimes occurred at the school district level, meaning that many of the substitute schools were immediately lost since they fell within the same school district area of jurisdiction. When the list of substitute schools within a primary sampling unit was exhausted, an attempt was made to find a substitute school within an adjacent county. If this was unsuccessful, an attempt was made to find a substitute school in another primary sampling unit that matched to the primary sample school with respect to degree of urbanization, percent minority enrolment, type and size of school and income level.

At each selected school, school personnel were asked to compile a roster of the classrooms having a subject that was required for the grade. One classroom was drawn from the submitted roster for each of grades 9 through 12 present at the school and all students who were members of the classroom were eligible to participate in the survey.

At the school level, 73 percent of the schools selected as primary sample or reserve sample (4 reserve schools for each primary selection) participated in the survey, yielding 202 schools. At the student level, 80 percent of the students in sampled classrooms completed a survey questionnaire, yielding 17,287 questionnaires.

### Store sample selection

The 202 schools served as the sampling location for store selection. Information on Marlboro, Camel and other store advertising and gift with purchase promotions were collected from up to three different types of stores within a one-mile radius from each participating school, with the possible store types including convenience/small grocery/delicatessen, supermarket, gas station, and drug store. Newport advertising and promotions were not recorded separately. Altogether, information was gathered from 581 stores from the 202 sites, comprising 302 convenience stores, 119 supermarkets, 78 gas stations and 82 drug stores. For the purposes of this analysis, we limited our sample to convenience stores for two main reasons. First, 196 of the 202 sites had at least one convenience store. Second, since tobacco advertising and promotions varied significantly by store type (Terry et al., 2000), we wanted to avoid introducing variation attributable to store type into the study. For sites with more than one convenience store in the sample, we chose the store nearest to the school or if stores were equidistant, we selected the first store visited in the sequence of store observations.



Information was collected from each store by trained observers and included presence of a promotion for Marlboro, Camel or other brand that offered a gift with purchase and counts of the number of Marlboro, Camel and other advertisements visible on the exterior of the store and inside the store. We determined the brand share of advertising voice by calculating the proportion of interior and exterior advertising for Marlboro and Camel out of the total number of interior and exterior advertisements respectively. Records of store advertising and promotion were merged with the student sample using the school identifier, so that there aimed to be a local convenience store matched to each student in the survey.

#### Data analysis

Of the 17,287 teenagers, 4,593 (26.6%) indicated that they had smoked in the past 30 days. We limited our sample to the 88.9% of these past 30-day smokers who had ever purchased their own cigarettes, which reduced our the sample to 4,081. From these we excluded 128 students who were from the six sites for which we had no available store information, leaving 3,890.

Smokers were asked “What brand of cigarettes do you usually smoke?” and asked to indicate only one brand. A list of 26 brands was provided, as well as the response “no usual brand”. Overall, 3,411 smokers indicated either a single usual brand or that they had no usual brand. However, 479 students incorrectly indicated more than one brand

and these students were omitted from the analysis. Finally, 218 cases were dropped due to item non-response on sex and race. Thus, our final sample size was 3,282.

Data were analyzed using SAS version 8. Logistic regression analysis was used to examine the association between exclusive brand choice being Marlboro or Camel versus all other choices and point of purchase advertising and promotion. Our models can be stated as:

$$\text{Log}\left(\frac{P_i}{1 - P_i}\right) = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

Where

- $P_i$  is the probability that Marlboro (Camel) is the exclusive choice to smoke.
- $a$  is the probability of choosing Marlboro (Camel) in the absence of point of purchase advertising and promotions.
- $X_1$  refers to gift with purchase
- $X_2$  refers to brand share of exterior advertising
- $X_3$  refers to brand share of interior advertising
- $X_4$  refers to total exterior ads
- $X_5$  refers to total interior ads

We controlled for gender, race and school grade in both models.

## Results

Table 1 shows the characteristics of respondents. Teenagers were equally distributed through school grade levels and by gender, with a majority of White students. Two-thirds of smokers with a usual brand smoked Marlboro and only 6% smoked Camel. In addition, 21.3% smoked Newport, with the remainder smoking a range of other brands at much lower percentages than Camel.

Table 2 shows that, of the 196 stores matched to the teenagers, Marlboro advertising and promotions were prevalent. 20.7% of convenience stores had a Marlboro gift promotion, and 14.0% had a Camel gift promotion. The number of interior tobacco advertisements ranged from 0 to 21, with a mean of 6.2 ads per store ( $sd=5.8$ ). Inside the average store, 38% of ads were for Marlboro, and 15% were for Camel, so that the brand share of advertising voice for each brand was 38% and 15% respectively. The number of exterior tobacco advertisements ranged from 0 to 25, with a mean of 4.6 ads per store. On the outside of the average store, the brand share of advertising voice was 38% for Marlboro and 12% for Camel.

We ran separate models to determine the association of these store advertising and promotion variables with choice of Marlboro and choice of Camel as a usual brand.

Table 3 shows that after controlling for gender, grade and race/ethnicity, the odds of a teenager choosing Marlboro was significantly and positively associated with presence of a Marlboro gift promotion; a higher proportion of Marlboro interior advertising; a higher

proportion of Marlboro exterior advertising; and a greater number of tobacco advertisements inside the store, irrespective of brand advertised. However, choice of Marlboro was not associated with the overall number of exterior store advertisements for tobacco.

Table 4 shows that after controlling for demographic variables, choice of Camel as a usual brand was significantly and positively associated with a higher proportion of Camel interior advertising, and a greater number of interior tobacco ads. However, choice of Camel was not associated with presence of a Camel gift promotion, or overall number of exterior ads and was negatively associated with the proportion of exterior ads for Camel.

## **Discussion**

This study found that, independent of the overall number of tobacco advertisements, the brand share of interior and exterior point-of-purchase advertising voice for Marlboro cigarettes was associated with a greater likelihood of teens smoking that brand. In addition, Marlboro gift with purchase promotions were associated with a greater likelihood of smoking Marlboro. Brand share of Camel interior advertising voice was associated with a greater likelihood of smoking Camel. In contrast to the pattern of findings for Marlboro, Camel gift with purchase was not associated with choice of Camel as a usual brand and a greater brand share of Camel exterior advertising voice was associated with a lower likelihood of smoking Camel. The pattern of results for

Marlboro are consistent with the results for analyses of aggregate data on the relationship between brand advertising and promotions and teen cigarette brand choice (Pollay et al., 1996), but those for Camel are inconsistent.

There are a number of limitations to this study that need to be considered. First, the study was cross-sectional, so the direction of any observed relationship between store advertising and promotions and teen brand choice is difficult to assign. There may be some other factor, such as the prevalence of adult smoking of Marlboro and Camel that is related to both teen brand choices to smoke either brand, and to the level of advertising and promotions for these brands in communities. However, on evidence available from previous studies on adult brand choice, this seems unlikely (Pollay et al., 1996).

Alternatively, the pervasiveness of store advertising and promotions may have been a reflection of variations in the extent of tobacco advertising in the broader local community, such as billboard advertising and community sponsorships. It may be that these types of advertising have a more important role to play in driving brand choices than store advertising and promotions. In this case, store tobacco brand advertising and promotions may have been related to brand choice because it simply co-occurred with other types of tobacco brand advertising. However, our study was not designed to assess this.

Second, only one store was selected per community to reflect in-store advertising for that community. The selected store may not reflect surrounding convenience stores. A sample which contained a greater number of stores per site might give a more reliable

reflection of extent of store tobacco advertising and promotions. In addition, since types of stores have different levels of point of purchase advertising and promotions (Terry et al., 2000), and convenience stores are only one type of store to which teenagers may be exposed, a sample which includes other types of stores would have been preferable. However, we did not have a sufficient number of other store types to represent each for the communities in the study. On the other hand, the selected store was the convenience store closest to the index school, increasing the likelihood that teenagers would be exposed to it.

Third, the measures of advertising and promotions were imprecise. We used simple counts of ads to measure overall amount of tobacco advertising, and to calculate proportion of brand specific ads to indicate brand share of advertising voice. However, we did not measure the size or placement of ads, or the type of gift with purchase promotions, and it is acknowledged that these factors may have influenced the salience of brand-specific advertising.

Given these limitations, the findings of this study must be considered preliminary. Brand share of interior store advertising voice for Marlboro and Camel are related to choice of each brand as a usual brand to smoke among teenage smokers. The inconsistent findings for Camel for brand share of Camel exterior advertising voice and Camel gift promotions deserve comment. First, we had only 6% of teens who indicated that they smoked Camel as a usual brand and we may have had inconsistent findings produced by the small number of cases available for analysis. Second, it is important to acknowledge that not

all advertising is likely to be equally effective in promoting sales of a product. Thus, Marlboro advertising and promotions may be more effective than Camel advertising and promotions in driving their respective brand choices. Kaufman et al. (2000) found that despite rising advertising and promotional expenditures for Camel cigarettes, its popularity declined among teenagers at a time when brand selection of Newport increased, suggesting that this interpretation may have merit.

In conclusion, this study has provided preliminary evidence that brand share of point of purchase advertising and promotions for Marlboro is positively associated with choice of Marlboro as a usual brand among teenagers. Better and more extensive measures of store advertising and promotions, as well as assessment of other sources of advertising in communities would be required to improve assessment of the relationship between brand share and brand choice by teenagers using this local area multilevel methodology.

There is evidence that since the ban on tobacco billboard advertising prompted by the Master Settlement Agreement (MSA), there has been an increase in point of purchase advertising and promotions (Wakefield et al., 2000). Tobacco companies themselves acknowledge the point of purchase environment as assuming new significance. For example, Mr Bexton of Brown and Williamson Tobacco Company, in referring to the post-MSA environment, was quoted as saying that “increasingly, the store will be treated not just as an outlet for volume, but as a targeted communication channel.” (Advertising Age, 3/1/99, page 12). Further research in exploring the relationship between point of purchase advertising and promotions and teen smoking is timely and important.

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Table 1: Characteristics of Respondents (N=3,282)

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Grade in School:		
	9	22%
	10	27%
	11	26%
	12	25%
Gender:		
	Male	49%
	Female	51%
Race/ethnicity:		
	White	62%
	African American	10%
	Hispanic	20%
	Other	8%
Brand of Cigarette You Smoke		
Exclusively:		
	Marlboro	66%
	Camel	6%

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Table 2: Characteristics of Matched Convenience Stores (n=196)

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Gift with Purchase in Store	
Marlboro	21%
Camel	14%
	Mean (s.d.)
Proportion Interior Ads are Marlboro	0.38 (0.34)
Proportion Interior Ads are Camel	0.15 (0.23)
Number of all Interior Ads	6.20 (5.76)
Proportion Exterior Ads are Marlboro	0.38 (0.42)
Proportion Exterior Ads are Camel	0.12 (0.23)
Number of all Exterior Ads	4.59 (5.70)

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Table 3: Odds of choosing Marlboro as a usual brand to smoke (N=3,282)

	<b>Odds ratio</b>	<b>95% CI</b>	<b>p</b>
Marlboro Gift	1.54	1.24-1.91	<.001
Proportion Interior Ads are Marlboro	1.33	0.99-1.77	0.05
Number of All Interior Ads	1.02	1.00-1.03	0.04
Proportion Exterior Ads are Marlboro	1.27	1.01-1.61	0.05
Number of All Exterior Ads	0.99	0.98-1.01	0.51
Male	1.06	0.90-1.25	0.46
White	1.82	1.39-2.38	<001
Black	0.05	0.03-0.08	<001
Hispanic	1.28	0.94-1.73	0.11
Grade10	0.96	0.77-1.21	0.75
Grade11	1.11	0.88-1.41	0.37
Grade12	1.16	0.91-1.47	0.22

Table 4: Odds of choosing Camel as a usual brand to smoke (N=3,282)

	<b>Odds ratio</b>	<b>95% CI</b>	<b>p</b>
Camel Gift	1.11	0.76-1.61	0.61
Proportion Interior Ads are Camel	3.35	1.74-6.44	<.001
Number of All Interior Ads	1.04	1.02-1.07	<.001
Proportion Exterior Ads are Camel	0.25	0.11-0.58	<.001
Number of All Exterior Ads	1.01	0.98-1.03	0.69
Male	1.75	1.30-2.35	<.002
White	1.16	0.71-1.89	0.56
Black	0.36	0.16-.84	0.02
Hispanic	0.36	0.18-0.71	<.01
Grade10	1.54	0.99-2.37	.05
Grade11	1.24	0.79-1.95	0.35
Grade12	1.32	0.84-2.08	0.23

**ImpacTeen**

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