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Storefront Cigarette Advertising Differs by Community Demographic Profile

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Abstract

Purpose—Tobacco manufacturers have targeted youth and ethnic/racial minorities with tailored advertising. Less is known about how characteristics of storefront tobacco advertisements, such as location, position, size, and content, are used to appeal to demographic subgroups.

Design—The occurrence and characteristics of storefront cigarette advertising were observed for all licensed tobacco retailers in two defined communities.

Setting—Measures were taken in two Boston, Massachusetts, area urban communities: a low-income, minority community and a high-income, nonminority community.

Subjects—No human subjects were involved in this study.

Measures—Advertisement position (attached or separated from storefront), size (small, medium, or large), mentholation, and price were recorded. Geographic coordinates of tobacco retailers and schools were mapped using ArcGIS 9.2.

Analysis—Differences between the communities in advertisement number and characteristics were assessed using bivariate analyses. Logistic regression was used to ascertain the odds of specific advertising features occurring in the low-income/minority community.

Results—The low-income/minority community had more tobacco retailers, and advertisements were more likely to be larger, promote menthol products, have a lower mean advertised price, and occur within 1000 feet of a school.

Conclusion—Storefront cigarette advertising characteristics that increase exposure and promote youth initiation were more prominent in a low-income/minority community. The findings emphasize the need for more effective regulation of storefront tobacco advertising.

Keywords

Tobacco; Health Disparities; Youth; Advertising; Prevention Research

PURPOSE

Everyday an estimated 3600 American youth commence smoking, 30% of whom become daily smokers.¹ Cigarette advertising influences youth perceptions of the pervasiveness and image of smoking² and has been found to be associated with smoking uptake among youth.^{3,4} Moreover, research has shown that youth are highly exposed to cigarette advertising^{5,6} and that youth prefer the most heavily advertised brands.^{7,8}

As part of the 1998 Master Settlement Agreement (MSA) between the state Attorney Generals and the major cigarette companies, cigarette makers agreed to not directly or indirectly target youth in their advertising and marketing efforts. The MSA prohibits the depiction of cartoons in cigarette advertising, limits event sponsorship, and restricts the location and size of cigarette advertising. Specifically, the MSA bans cigarette billboard advertising, as well as promotions on or around public transit, stadiums, arenas, shopping malls, and video arcades. Thus, outdoor cigarette advertising is prohibited except on retailer property, on which individual advertising units are limited to 14 square feet.⁹ Field surveys have documented increased numbers of exterior and interior retail tobacco advertising after implementation of the MSA.^{10,11} Such changes suggest that tobacco companies have been adapting to MSA advertising constraints by increasing marketing efforts in retail outlets.

There has been substantial documentation of targeting of subgroups by the tobacco industry, particularly youth¹² and African-Americans.^{13,14} Storefront cigarette advertising, which consists of externally visible advertisements placed on the retailer storefront and advertisements separated from storefronts and located on retailer property, may be one important strategy by which the industry promotes tobacco use in a manner designed to selectively reach specific populations. Since the MSA, increased retail tobacco advertising has been found in African-American communities in both California¹⁵ and Massachusetts.¹⁶ Compared with white Americans (23.5%), a greater percentage of the African-American population is under 18 years (31.4%).¹⁷ Therefore, youth populations may be greater in African-American communities. The enhanced presence of cigarette advertising in African-American communities raises concerns about youth exposure and menthol cigarette promotion. Historically, menthol cigarette advertising has been targeted toward African-Americans,^{13,14} and menthol cigarettes have been implicated in facilitating smoking initiation among youth.¹⁸ Moreover, tobacco advertising has been found to be more heavily displayed in areas of lower socioeconomic status,¹⁶ where smoking prevalence is often higher.¹⁹

Although previous surveys have documented the quantity of storefront tobacco advertising,^{10,11,15} relatively little is known about how specific characteristics of tobacco advertisements, such as their location, position, size, and content, are used to appeal to youth and minority populations. Earlier studies have reported that tobacco advertising located within 1000 feet of schools may provide an enhanced opportunity for exposure to youth.^{16,20} Advertisements that are positioned at eye level for younger persons also may enhance opportunity for youth exposure.^{11,16} The size of an advertisement may affect the visibility of the messaging and the number of individuals exposed (e.g., a small sticker vs. a large poster). The significance of advertisement size has received limited attention. Glanz et al.⁸ weighted outdoor cigarette advertising units by size to reveal Kool as the most advertised brand with and without adjusting for the size of all advertisements. Finally, advertisements may include content that enhances its impact on youth. The use of models who match the racial or ethnic profile of the neighborhood in which the advertisement is found may be one such strategy.¹⁶ Although price has been demonstrated to be a significant factor related to youth smoking,²¹ this potentially important content feature has not been well documented in storefront advertising and has been previously reported in only one known study.²² Actual retail prices and indoor price promotions have been more commonly observed.^{11,15,23}

The present study aimed to assess the features of storefront cigarette advertising that may be associated with youth exposure and smoking initiation a decade after the MSA. We hypothesized that advertisement features (location, position, size, and content) that may influence youth smoking would be more pervasive in a predominately low-income minority community compared with a predominantly high-income nonminority community.

METHODS

Study Design and Sample

A cross-sectional field survey of storefront cigarette advertising was conducted in two Massachusetts communities located within the greater Boston, Massachusetts, urban area: Dorchester and Brookline. The two communities were chosen because they share close proximity but have contrasting demographic composition and were each easily accessible by the research team. According to the 2000 U.S. Census,²⁴ Dorchester has a large African-American population (50.1%), with 21.7% of its residents living below the federal poverty line. By contrast, Brookline has a much smaller African-American population (2.7%) and 9.3% of its residents living below the federal poverty line (Table 1).

Tobacco retailer listings for Brookline and Dorchester were obtained from the Massachusetts Department of Public Health (MDPH) and City of Boston Public Health Commission (BPHC), respectively. Whereas MDPH provided a listing of all tobacco retailers within the town of Brookline, BPHC provided retailer listings for individual zip codes. Using the United States Postal Service Web site (<http://www.usps.com>), four zip codes were listed for Dorchester, Massachusetts, and retailer listings were obtained for each. A total of 43 registered tobacco retailers in Brookline and 196 in Dorchester were identified from these sources. According to the 2000 U.S. Census,²⁴ the populations of Brookline and Dorchester were 57,107 and 134,004, respectively (Table 1). Because of the discrepancy in the population of each community, Dorchester was limited to a single zip code, 02124, from the denominator of four zip codes. We selected the 02124 zip code of Dorchester for its similar population (50,781) to that of Brookline (57,107). (The three remaining zip codes in Dorchester [02122, 02121, and 02125] each had a population considerably smaller than Brookline's.) The 02124 zip code provided a good representation of the whole of Dorchester in terms of: racial/ethnic characteristics, percent of population older than 18 years, median income, percent of population below the poverty line, and highest educational level reached (Table 1). The selection of one Dorchester zip code eliminated the large discrepancy in the number of tobacco retailers within the two communities—59 registered tobacco retailers were identified in Dorchester (02124) compared with 43 in Brookline—while continuing to emphasize the marked differences in minority and socioeconomic profile of the two communities.

Measures

Each identified tobacco retailer was visited by one of two members of the research team (A.B.S. and R.W.C.) from November 2007 to February 2008, and all outdoor retail cigarette advertising units were quantified and described using a standardized survey instrument. The survey was modeled after the Massachusetts Operation Storefront survey²⁰ but modified to meet additional aims of this study. Advertising for smokeless tobacco, cigars, and little cigars were excluded from this report because of low prevalence of advertising of these products. For every externally visible cigarette advertisement, position (attached to retailer or separated from storefront and located on retailer property), size (small: not exceeding an 8.5 × 11 inch [.06 m²] area; large: 2 × 3 feet [.56 m²] area or larger; and medium: sized between small and large), mentholation, and advertised price were recorded. Inter-rater reliability was validated using independent rater assessments of a mutual 10% (N = 10) sample of tobacco retailers. Advertisement number and individual feature characteristics were scored and compared. A high degree of inter-rater agreement was observed across all measures (Cohen's $\kappa \geq .886$).

Using ArcGIS 9.2, the geographic coordinates of all tobacco retailers were mapped. Primary and secondary school locations were plotted on the same map. Schools were identified using

Geographic Names Information System and compiled by the makers of the mapping software (last updated January 2007). Geometric buffers of 1000 feet were created around each mapped school and tobacco retailers located within 1000 feet of any school were thus identified.

A two-part analytic approach was employed. Bivariate analyses were used initially to assess differences in advertisement number and characteristics between the two communities. Mean advertised cigarette pack price differences were examined using *t*-tests. Fisher's exact test and χ^2 tests were used to test for community-level differences between remaining advertisement features. These analyses were repeated using a weighting for size of advertisement, based on the assumption that larger tobacco advertisements may have a greater visual impact. Following the strategy developed by Glanz et al.,⁸ small, medium, and large advertisements were assigned weighting factors of one, two, and three, respectively. Logistic regression analyses were then conducted to ascertain the odds of specific advertising features occurring in Dorchester, compared with Brookline, while simultaneously controlling for other advertising features.

RESULTS

The two communities observed differed in minority status, income, education, and age of the population (Table 1). Of the 102 registered tobacco retailers in Brookline and Dorchester, four were no longer in business or were not located at the listed addresses. Observations were completed for the remaining 98 retailers: 42 in Brookline and 56 in Dorchester. There was an overall significant difference in the proportion of store types found in each community ($\chi^2(5) = 13.3; p = .02$), with a greater number of convenience stores observed in Dorchester (Table 2). Ranging from 0 to 32 storefront cigarette advertisements per retailer, 403 individual cigarette advertisements were identified within the two communities. These included stickers, placards, posters, illuminated signs, and price listings.

Although tobacco retailers located in Dorchester represented 57% (56/98) of all retailers visited, they displayed 76% (308/403) of the storefront cigarette advertising units within the two communities. The percentage of retailers displaying storefront cigarette advertisements was also significantly higher in Dorchester (86%) than Brookline (43%) ($p < .001$). However, there was no statistical difference in the mean number of storefront cigarette advertisements per retailer between the two communities among retailers that displayed tobacco advertising (Dorchester and Brookline means, 6.6 and 5.3, respectively; $p = .444$) (Table 2).

Differences in size and other characteristics of storefront cigarette advertising were also found between the two communities. Compared with Brookline, Dorchester had a greater proportion of large ($p < .001$) and medium advertisements ($p = .010$), as well as an increased proportion of menthol brand advertising ($p < .001$). Moreover, a greater proportion of cigarette advertisements in Dorchester displayed a price ($p = .001$), and the mean advertised cigarette pack price was \$0.39 less in Dorchester than in Brookline ($p < .001$). Although a greater proportion of detached advertisements and advertisements within 1000 feet of any school were found in Dorchester, these differences were not significant (Table 2).

Using the Glanz et al.⁸ weighting factor, advertising characteristics were compared between the two communities weighting each advertisement by size. The weighted analysis found that the proportion of advertisements within 1000 feet of schools ($p = .006$) and detached advertisements ($p = .004$) were significantly greater in Dorchester. Dorchester retailers also

showed a significantly greater proportion of menthol advertisements ($p < .001$) and advertisements featuring a price ($p < .001$), after weighting.

Factors associated with Dorchester cigarette advertising (compared with Brookline) were explored using logistic regression. Univariate analyses found that larger advertising units (medium and large), menthol brand advertisements, and advertisements displaying a price had, respectively, 4.42 (2.89–6.74), 5.36 (3.03–9.49), and 2.16 (1.35–3.45) greater odds of being found in Dorchester compared with Brookline (Table 3). After controlling for all other advertising characteristics, including the weighting of ad size described above, multivariate analyses revealed that advertisements located within 1000 feet of schools, larger advertisements, and menthol brand cigarette advertisements had 1.97 (1.09–3.56), 4.79 (2.83–8.11), and 4.99 (2.70–9.23) greater odds of being found in Dorchester compared with Brookline, respectively (Table 3).

DISCUSSION

The characteristics of storefront cigarette advertising in the minority, low-income community of Dorchester (02124) were compared with the predominantly white, high-income community of Brookline. In Dorchester, a greater proportion of cigarette advertising was found and a significantly greater percentage of retailers displayed storefront cigarette advertising, compared with Brookline. Greater proportions of advertisements in Dorchester were larger, promoted menthol products, included a price, and featured a lower mean price, compared with Brookline. Such advertising features may appeal to youth. When advertisements were weighted by size, these differences in advertisement characteristics became more pronounced. Strikingly, after controlling for other advertisement characteristics, advertisements in Dorchester were almost twice as likely to be located within 1000 feet of a school, compared with Brookline. The data suggest that tobacco companies, with the implicit cooperation of retailers, may be using advertising features not explicitly banned under the MSA to promote tobacco use among youth and persons of minority race and low-income background.

The dissimilarities in storefront cigarette advertising raise serious concerns for public health protection and promotion. Current trends reveal that African-Americans are disproportionately affected more by tobacco-related morbidity and mortality compared with white Americans.²⁵ In addition, census data reveal that Dorchester has a larger proportion of residents under 18 years than Brookline (Table 1). This potential for greater exposure to youth, combined with use of advertisement features that are known to appeal to youth, may give rise to a disproportionately greater influence of tobacco advertising on youth in Dorchester, compared with Brookline.

The findings of more cigarette advertising and menthol cigarette advertising in Dorchester are consistent with previous advertising surveys conducted both before and after the MSA. Prior research has documented higher concentrations of tobacco billboards^{26,27} and greater retail advertising^{15,16} in minority and low-income communities. Pucci et al.¹⁶ also identified a higher percentage of menthol brand advertising (Newport, Kool, and Salem) in predominantly Latino and African-American communities compared with predominantly nonminority communities. In addition, a survey conducted prior to the MSA in Massachusetts found menthol advertising to be two to three times more likely to be located in minority communities.²⁰

Detached advertisements were commonly placed in prominent locations such as sidewalks, attached to telephone poles, and in parking lots. These placements may enhance visibility of the advertisements to customers and passersby. Unweighted analysis did not show a

difference in the proportion of cigarette advertisements that were detached between the two communities. However, after weighting the advertisements by size, a significantly greater proportion of larger detached advertisements were found in Dorchester. Because of the larger size and detached placement of these advertisements, opportunities of exposure may be greater for youth in Dorchester.

To the authors' knowledge, this is the second study to document outdoor cigarette advertisement size and the first to compare other advertising characteristics based on size.⁸ The study assumed that larger advertisements have a greater visual impact than smaller advertisements, and secondary analyses were performed after weighting each advertisement by size. Under the advertising regulations promulgated by the MSA, advertisement size was an important restriction implemented to help curtail advertising to youth. However, more research is needed to better understand how cigarette advertisement size affects visibility and perception of the advertisement's messaging. This is only the second study known to the authors to document advertised cigarette prices in storefront advertising. Jason et al.²² found that the percentage of storefront tobacco advertisements with prices decreased between 1999 and 2001 in 11 towns in Northern Illinois. The authors cited increased cigarette prices following the MSA as a possible explanation for this trend. This study found a greater percentage of storefront cigarette advertisements featuring prices in Dorchester and a lower mean advertised price in Dorchester, compared with Brookline. Residents of lower-income communities may be more sensitive to price promotions, which may partly explain the lower advertised prices and greater occurrence of displayed prices in Dorchester compared with Brookline. However, mean advertised prices may reflect differences in the advertising frequency of premium and discount brands rather than price discounting. Moreover, adjustments were not made for other economic factors that can affect price. Despite these caveats, advertised prices are likely to be seen by consumers and may play an important role in shaping purchasing attitudes and decisions.

Although we documented no advertising violations of the MSA, this study reveals a major weakness in the advertising restrictions outlined under the settlement. The MSA limits individual cigarette advertising units to 14 square feet yet sets no restriction on the total amount of cigarette advertising that can be displayed by a retailer. One retailer displayed a total of 32 branded cigarette advertisements, many placed with no space between adjacent advertisements. The combined total amount of cigarette advertising at this and many other tobacco retailers far exceeded 14 square feet. In the absence of restrictions on the total amount of cigarette advertising on retailer property, manufacturers may be able to selectively reach subgroups, such as youth and minorities, through placement of cigarette advertising with tailored characteristics in selected areas.

We present this study as an analysis of a limited geographic area, and there are limitations that prevent generalization to other communities. Because of its cross-sectional design, this study was able to capture the status of advertising only at one point in time. It is not known whether or how frequently storefront cigarette advertising within the two communities might change. Only further surveying of the same retailers at a later time can establish whether the advertising characteristics observed are stable over time. The decision to include only one zip code in Dorchester allowed comparisons of similarly sized populations but prevents generalizability to all of Dorchester or to other communities across the United States. Factors not measured in the current study may influence the content of storefront advertising, including population density (less dense areas may use larger ads to attract persons traveling by car), and children's exposure may be influenced by availability of transportation and whether the school attended is in the same community as the child's residence. Finally, only outdoor cigarette advertising was assessed in this study.

Considerable advertising and promotions have been identified inside the premises of tobacco retailers^{11,15} as well, which may enhance youth cigarette advertising exposure.

The Commonwealth of Massachusetts attempted to prohibit storefront advertising near schools and playgrounds in 1998 through a consumer protection regulation, but it was prevented by a legal challenge. Had such a restriction been implemented, cigarette advertising within 1000 feet of schools would not have been observed in this study (combined total of 130 branded cigarette advertisements). The recently enacted Family Smoking Prevention and Tobacco Control Act²⁸ provides the U.S. Food and Drug Administration (FDA) with the authority to regulate tobacco products, including a provision that bans cigarette advertising within 1000 feet of schools and playgrounds. The FDA will also require additional advertising restrictions, including the requirement that all retail cigarette advertisements consist only of black text on white background. Moreover, the Family Smoking Prevention and Tobacco Control Act will now allow states and local communities to adopt further restrictions on cigarette advertising and promotions that were previously preempted under the Federal Cigarette Labeling and Advertising Act. Cities such as Boston (which includes Dorchester) and Brookline now have the capacity to “ban or restrict the time, place, and manner, *but not the content*, of the advertising or promotion of any cigarettes”²⁸ (emphasis added). This is an important step toward providing protection from targeted advertising to youth in minority and lower-income communities. However, because the present data suggest that the content of cigarette advertising, such as price, is tailored toward lower-income communities, we would also recommend that advertisement content be considered for regulatory restriction. More work is required to complete a comprehensive, evidence-based regulatory strategy for outdoor cigarette advertising that will restrict tobacco promotion aimed at youth and further denormalize the acceptance of smoking in American communities.

SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

The tobacco industry has used storefront advertising to target youth and minority ethnic/racial groups. Little is known about how specific characteristics of tobacco advertisements, such as their location, position, size and content, are used to appeal to youth and minority populations.

What does this article add?

This paper describes a study of the presence and features of storefront cigarette advertising in two demographically contrasting communities. We present evidence that features of tobacco advertising are manipulated to attract youth or racial minority sub-groups, and these features are disproportionately evident in low income, minority communities.

What are the implications for health promotion practice or research?

Despite the broad protections from targeted advertising for youth that the 1998 Tobacco Master Settlement Agreement provides, storefront advertising is not included in this agreement. However, recent congressional approval providing the US Food and Drug Administration with regulatory authority of tobacco products permits further restrictions on tobacco marketing and may help curtail youth exposure to this form of cigarette advertising.

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Table 1

Demographic Characteristics* of Brookline and Four Zip Codes of Dorchester

	Brookline	02124 [†]	02122 [‡]	02121 [‡]	02125 [‡]
Population	57,107	50,781	24,548	25,057	33,618
White	81.1%	21.4%	41.8%	4.9%	35.1%
Black or African American	2.7%	59.9%	27.7%	77.3%	31.3%
Hispanic or Latino	3.5%	12.6%	10.3%	19.0%	16.3%
≥18 years	83.4%	69.4%	72.5%	65.1%	72.4%
Median family income	\$92,993	\$38,203	\$40,874	\$28,735	\$36,195
Individuals below poverty level	9.3%	21.1%	14.1%	24.1%	20.1%
Bachelor's degree or higher	76.9%	17.4%	17.7%	12.2%	19.1%
Tobacco licenses, no.	43	59	58	32	47

* Based on U.S. 2000 Census.

[†] Dorchester.[‡] Excluded from survey.

Table 2
Number and Characteristics of Storefront Cigarette Advertisements by Community

	Brookline	Dorchester*	<i>p</i>
Retailers, No.	42	56	
Retailer type, No.			0.02
Alcohol (wine/liquor)	9 (21.4%)	6 (10.7%)	
Convenience store	7 (16.7%)	27 (48.2%)	
Gas	8 (19.0%)	6 (10.7%)	
Grocery	7 (16.7%)	10 (17.9%)	
Pharmacy	7 (16.7%)	6 (10.7%)	
Other	4 (9.5%)	1 (1.8%)	
Total ads, No.	95	308	
Retailers with ads, No.	18 (42.9%)	48 (85.7%)	<0.001
Mean ads/retailer [‡]	5.3	6.6	0.444
Location			
Ads within 1000-foot radius of schools, No.	26 (27.4%)	104 (33.8%)	0.244
Position			
Detached ads, No.	8 (8.4%)	50 (16.2%)	0.058
Size			
Small ads	54 (56.8%)	62 (20.1%)	<0.001
Medium ads	39 (41.1%)	173 (56.2%)	0.010
Large ads	2 (2.1%)	73 (23.7%)	<0.001
Content			
Menthol ads, no.	17 (17.9%)	166 (53.9%)	<0.001
Ads with price, no.	39 (41.1%)	185 (60.1%)	0.001
Mean advertised pack price [‡]	\$4.94	\$4.55	<0.001

* Limited to 02124 zip code.

[‡] Means do not include retailers without advertisements.

[‡] Limited to advertisements that displayed prices.

Table 3

Odds of Tobacco Advertising Characteristic Being Found in Dorchester (02124) Compared With Brookline*

	Univariate Analysis OR (95% CI)	Multivariate Analysis OR (95% CI)
Within 1000 feet of schools	1.35 (0.81–2.25)	1.97 (1.09–3.56)
Detached from storefront	2.11 (0.96–4.62)	0.59 (0.22–1.57)
Size [†]	4.42 (2.89–6.74)	4.79 (2.83–8.11)
Menthol	5.36 (3.03–9.49)	4.99 (2.70–9.23)
Price presence	2.16 (1.35–3.45)	1.33 (0.76–2.33)

* CI indicates confidence intervals; and OR, odds ratio.

[†] Large- and medium-sized advertisements.