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Point-of-sale tobacco marketing in rural and urban Ohio: Could the new landscape of Tobacco products widen inequalities?

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A B S T R A C T

Considerable research has examined how cigarette point-of-sale advertising is closely related to smoking-related disparities across communities. Yet few studies have examined marketing of alternative tobacco products (e.g., e-cigarettes). The goal of the present study was to examine external point-of-sale marketing of various tobacco products and determine its association with community-level demographics (population density, economic-disadvantage, race/ethnicity) in urban and rural regions of Ohio. During the summer of 2014, fieldworkers collected comprehensive tobacco marketing data from 199 stores in Ohio (99 in Appalachia, 100 in Columbus), including information on external features. The address of each store was geocoded to its census tract, providing information about the community in which the store was located. Results indicated that promotions for e-cigarettes and advertising for menthol cigarettes, cigarillos, and cigars were more prevalent in communities with a higher percentage of African Americans. Cigarillos advertising was more likely in high-disadvantage and urban communities. A greater variety of products were also advertised outside retailers in urban, high-disadvantage, African American communities. Findings provide evidence of differential tobacco marketing at the external point-of-sale, which disproportionately targets urban, economically-disadvantaged, and African American communities. There is a need for tobacco control policies that will help improve equity and reduce health disparities.

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Introduction

The burden of tobacco unduly affects certain populations, including people living in rural areas, people of low socioeconomic status (SES), and racial/ethnic minorities (Garrett et al., 2013; Wewers et al., 2006). Contributing to these differences, the tobacco industry has for many decades targeted its advertising at vulnerable populations (Yerger et al., 2007). For example, research has found more storefront advertising in low-income communities (Seidenberg et al., 2010), greater point-of-sale marketing for stores closer to, compared to farther from, schools (Pucci et al., 1998) and targeted advertising of menthol cigarettes to African American communities (Moreland-Russell et al., 2013).

With increased restrictions on the channels for advertising cigarettes, the tobacco industry has made advertising at the retail point-of-sale a primary focus (Pollay, 2007). Accordingly, the tobacco industry is directly involved in how its products are marketed at the point-of-sale, incentivizing retailers to post advertising and signage, provide product displays, and give price-related promotions (Lavack and Toth, 2006). Social ecological theory (McLeroy et al., 1988) suggests

these point-of-sale advertisements can have powerful effects on intrapersonal and individual behavior. Research on cigarette smoking shows that exposure to point-of-sale tobacco marketing distorts adolescents' perceptions about the availability and popularity of tobacco (Henriksen et al., 2002) and increases their curiosity about its use (Portnoy et al., 2014). Moreover, exposure to point-of-sale tobacco marketing is associated with increasing the likelihood of smoking initiation (Henriksen et al., 2010) and impeding smoking cessation (Cantrell et al., 2015). When retailers use externally-visible advertising, individuals need not even enter the establishment to experience these exposures. Yet external advertising may also be more open to policy-based restrictions. In particular, local laws are typically upheld when they are "content-neutral" (restricting all outside advertising, rather than tobacco advertising alone). Such regulations can restrict the time, place, or manner of advertising—such as by prohibiting advertisements in residential areas, restricting their size, or delineating how far they must be from pedestrian areas.

Now, with the changing landscape of tobacco products, surveillance of the new point-of-sale environment is critical. Although research on point-of-sale marketing for cigarettes has increased, little research has examined alternative products like smokeless tobacco, cigars, cigarillos, or e-cigarettes (Lee et al., 2015). Understanding the current marketing strategies of the tobacco industry will help inform local, state, and FDA

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policy. Given the history of differential marketing of tobacco products to vulnerable populations, it is particularly important for public health research to monitor how advertising varies based on community demographics. Therefore, the purpose of the present study was to examine external point-of-sale marketing of various tobacco products and determine whether this marketing was associated with community-level demographic characteristics (population density, economic disadvantage, race/ethnicity) in urban and rural regions of Ohio.

Methods

Study setting and population

We obtained a list of all tobacco licenses issued within our seven Ohio counties of interest: Franklin County, which comprises the city of Columbus; and Brown, Guernsey, Lawrence, Muskingum, Scioto, and Washington Counties, which comprise areas of rural Appalachian Ohio. Columbus is a diverse city, with a population of approximately 822,000, of whom 59% are non-Hispanic White (U.S. Census Bureau, 2015). In contrast, the Appalachian region of Ohio is primarily rural, non-Hispanic White, and disadvantaged, with lower income, education, and health statuses than the rest of Ohio and the majority of the U.S. (Pollard and Jacobsen, 2014; Wewers et al., 2006)

Proportional sampling was used to select 230 retailers from Columbus and Appalachia. For Columbus, retailers were stratified by location within the city and median income level. For Appalachia, retailers were stratified by county and location within vs. outside a major town. This sampling approach resulted in the number of retailers sampled within each strata being proportional to the total number of retailers.

Of the 230 establishments selected for the point-of-sale audit, 14 could not be observed because they were out of business or not open to the public, 9 could not be located, and 2 did not sell tobacco despite having a license. Data were also not collected at 5 stores that were atypical for tobacco establishments (e.g., a used furniture store), and at one location where the audit was stopped by store staff. After these exclusions, a final sample of 199 retailers (100 in Columbus, 99 in Appalachia) remained for the present analyses.

Fieldworker assessments

During the summer of 2014, fieldworkers collected comprehensive tobacco marketing data from the 199 stores. These point-of-sale audits were conducted by undergraduate fieldworkers during daylight and regular store hours. Fieldworkers were trained extensively to visually inspect each retailer and record their observations on a standard data collection form (see Measures section for more details). The paper-and-pencil data collection form was developed based on work by others (Rose et al., 2013). Information on the store's external features (the focus of the present paper) was collected first; permission from store clerks was then obtained for the audit of the store's internal features (the results of which will be reported in a forthcoming network-analysis paper).

Geocoding

The address of each store was geocoded using ArcGIS software. With the statistical software R, we then used shapefiles provided by TIGER/Line (https://www.census.gov/geo/maps-data/data/tiger-line.html) to find the census tracts for each geocoded address. Finally, data from the 2010 U.S. Census were then used to determine tract-level sociodemographic characteristics of the communities in which each retailer was located.

Measures

Audit data

Fieldworkers first recorded the type of store being audited (checklist items included gas stations and convenience stores). In terms of information on the exterior (on windows/doors, building, sidewalk, parking lot, fuel pumps, or elsewhere), they recorded what type of products were advertised outside the store (checklist options included menthol cigarettes and e-cigarettes). These measures were also used to create a continuous scale for the number of different product types sold (possible scale range: 0–6). Fieldworkers also recorded the products that received promotional advertisements (e.g., special prices or coupon rates). We tested interrater reliability for external audits using kappa coefficients several times at the study onset and found moderate to good agreement ($\kappa = .50–.76$).

2010 U.S. Census data

For the census tracts in which audited retailers were located, we obtained information about: the percentage of the population that was African American, the percentage that was aged 21 or older, and various indicators of poverty. We took the average of four primary economic-disadvantage indicators (% population unemployed, % population making < $10 K, % families below the poverty level, and % all people below the poverty level) to be our aggregate measure of community disadvantage (Cronbach's $\alpha = .92$).

Investigating interactions across multiple community demographics presented difficulties due to multicollinearity and empty cells (e.g., over 90% of all census tracts of interest in Appalachia had populations that were less than 6% African American). Therefore, we created a categorical variable, *Community Type,* and coded all census tracts of interest based on three criteria: (1) a low vs. high percentage of African Americans (<25% or ≥25%, respectively); (2) low vs. high levels of disadvantage (based on a mean split of the disadvantage variable); and (3) area in Ohio (Columbus vs. Appalachia). There were only 7 retailers located in regions categorized as Low-Disadvantage African American communities; due to the small cell size, these retailers were excluded from analyses looking at differences across Community Type. After these exclusions, our categorization yielded five community types:

Low-Disadvantage/Low-African–American/Columbus communities
Low-Disadvantage/Low-African–American/Appalachian communities
High-Disadvantage/Low-African–American/Columbus communities
High-Disadvantage/Low-African–American/Appalachian communities
High-Disadvantage/High-African–American/Columbus communities

Analyses

Analyses began with descriptive statistics of the retailers sampled and the products being advertised and promoted outside. We next used chi-square tests to examine how external advertising and promotions varied across community characteristics. Finally, we conducted a one-way analysis of variance (ANOVA) with planned contrasts to determine whether the variety of product types advertised outside was greater in high-disadvantage, African American communities. Due to the large undergraduate population within areas of Columbus, this analysis covaried for age (operationalized as the census' measure of residents over the age of 21).

Results

Of the retailers sampled, 37% were gas station convenience stores and 23% were stand-alone convenience stores; other retailers included mass merchandisers, grocery stores, drug stores, alcohol stores, tobacco shops, and bars/restaurants. The most prevalent external ads were for non-menthol cigarettes (60%), followed by menthol cigarettes (38%), e-cigarettes (35%), cigarillos/little cigars (28%), smokeless tobacco (30%), and cigars (4%). For external promotions (e.g., price reductions), 57% of the retailers had promotions for cigarettes, 15% had promotions for e-cigarettes, and 40% had promotions for other types of tobacco products.

Table 1 shows that tobacco advertisements were generally more prevalent among retailers in Columbus, compared to Appalachia. Consistent with previous point-of-sale research (Cantrell et al., 2013; Henriksen et al., 2012; Yerger et al., 2007). Advertising for menthol cigarettes, cigars, and cigarillos was more likely in communities with a higher percentage of African Americans ($ps < .04$). Higher percentage African American communities were also significantly related to promotions for e-cigarettes ($p = .04$). Advertising for cigarillos was also more likely in high-disadvantage communities ($p = .02$).

When examining the number of different types of products sold, a greater number was advertised by retailers in Columbus' high-disadvantage, African American communities (M = 2.6, SD = 1.5) and, unexpectedly, in Columbus's low-disadvantage, White communities (M = 2.3, SD = 1.8). For the ANOVA predicting the number of products advertised, there was a significant main effect for Community Type, $F(4, 181) = 2.67$, $p = .034$ (see Fig. 1). Planned contrasts showed a greater number of products were advertised in Columbus' high-disadvantage, African American communities than in Appalachia's