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Alcohol and tobacco marketing: An evaluation of compliance with restrictions on outdoor ads

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Abstract

Background—Historically, the alcohol and tobacco industries have been the biggest users of outdoor advertising. However, the 1999 Master Settlement Agreement (MSA) outlawed tobacco billboards and transit furniture ads and the Outdoor Advertising Association of America (OAAA) has pledged to voluntarily eliminate ads for alcohol and tobacco within 500 feet of schools, playgrounds, and churches.

Methods—We observed outdoor advertisements (2004–2005) in a sample of 106 urban census tracts in Pre-Katrina southern Louisiana and 114 in Los Angeles County to evaluate tobacco and alcohol advertisers' compliance with the MSA and the OAAA Code of Principles. Data were analyzed in 2007–2008.

Results—More than 1 in 4 tobacco ads in Louisiana failed to comply with the MSA. In Los Angeles, 37% of alcohol ads and 25% of tobacco ads were located within 500 feet of a school, park, or church; in Louisiana, roughly 1 in 5 ads promoting alcohol or tobacco fell within this distance. In Los Angeles, low-income status and the presence of a freeway in the tract were associated with 40% more alcohol and tobacco billboards near children. In Louisiana, each additional major roadway-mile was associated with 4% more tobacco ads in violation of MSA and 7% more small ads near schools, parks, and churches; city jurisdiction accounted for 55% of MSA violations and more than 70% violations of OAAA guidelines.

Conclusions—Cities must be empowered to deal locally with violations of the MSA. Legislation is needed to force advertisers to honor their pledge to protect children from alcohol and tobacco ads.

Introduction

Spending on outdoor advertising has increased 67% in the last 20 years, growing from a \$2.1 billion industry in 1985 to \$3.5 billion in 2005, after adjusting for inflation.^{1,2} Much of

this is due to Americans' reliance on automobiles³ and the fact that, in a media environment where consumers freely choose among internet, television, radio, etc., outdoor advertising offers a medium that is difficult for consumers to avoid.⁴ Studies of perception indicate that attention is automatically diverted to large visual stimuli,⁵ which frequently influence people, whether or not they are even aware of the images.^{6,7,8} As a result, individuals typically have little insight as to how visual images influence subsequent unhealthy behaviors^{9,10} like drinking and smoking.

Historically, the alcohol and tobacco industries have been the biggest purchasers of outdoor advertising space. Together they accounted for nearly a quarter of all expenditures on outdoor advertising in 1985.¹¹ In part, this reliance on outdoor was the tobacco industry's response to the broadcast ban of cigarette ads in 1972¹¹ and the alcohol industry's strategy to reach consumers after it voluntarily banned ads for hard liquor on radio and television in its 1934 Code of Good Practice for Distilled Spirits Advertising and Marketing.^{12,13} However, with the voluntary ban lifted in 1996 and the Master Settlement Agreement (MSA) in 1999 with 46 individual states which outlawed the use of all billboards and transit benches to promote tobacco use^{14,15} the panorama has changed significantly.

Past research has identified systematic targeting of vulnerable communities by outdoor advertising, especially for unhealthy products. Studies in San Francisco, New Jersey, Chicago, Los Angeles and Boston found that minority tracts had more billboards per 1000 population than Caucasian tracts¹⁶ and that African American and Latino neighborhoods disproportionately contained advertisements for tobacco and alcohol products.^{18–22} One study of Boston also found that neighborhoods with lower socioeconomic status also had more tobacco advertisements than more affluent neighborhoods.²³

Reacting to this perceived saturation of unhealthy ads, many urban communities organized to pass local ordinances prohibiting these advertisements within 1000 feet of places where children could be present.¹⁸ However, after a 2001 Supreme Court ruling found these bans to be unconstitutional,²⁴ communities were left with only a pledge by the Outdoor Advertising Association of America (OAAA) to restrict outdoor ads for products illegal for sale to minors within 500 feet of schools, public playgrounds, and places of worship in its Code of Industry Principles.²⁵

This paper studied outdoor advertisements in a sample of urban census tracts in Pre-Katrina southern Louisiana and Los Angeles County to: 1) understand the format and placement of alcohol and tobacco ads, 2) evaluate how compliance with the Master Settlement Agreement (MSA) and the OAAA Code of Principles varies across neighborhoods.

Methods

The sampling frame in Los Angeles County consisted of all the urban residential census tracts located within a 17-mile radius of Martin Luther King hospital in South Central Los Angeles, with "urban" defined as having more than 2,000 residents per square mile in the 2000 U.S. census. In Louisiana, all the urbanized tracts located in parishes (equivalent to counties) within 100 miles of New Orleans served as the sampling frame. From these tracts, 114 tracts were randomly selected at each site, for a total of 228 census tracts. WHY THIS NUMBER OF TRACTS?? In Louisiana, data collection was suspended when Hurricane Katrina struck, after measurements were collected in 106 census tracts.

Field staff took part in a three-day training session in Los Angeles on how to gather data on outdoor advertisements. The first day included classroom lectures designed to familiarize trainees with operational definitions and coding conventions. The second day of training began with a review of definitions, followed by brief trials of coding using samples of

products and a practice measurement in local alcohol outlets was conducted, with a concurrent assessment conducted by the co-principal investigators. The third day was training and practice on billboard observations and data recording using GPS monitors. The observation form and protocols were revised based on the outcome of this training session. Six weeks later, there was a two-day retraining and assessment session for both teams and the quality control supervisor conducted a reliability audit in New Orleans. Feedback from assessments was provided to counter observer-drift and reduce any inter-observer disagreement.

Observers in two-person teams visited sampled census tracts from September 2004 to August 2005 in Southern Louisiana and from October 2004 to November 2005 in Los Angeles County. They systematically surveyed each tract once, first following the perimeter of each tract and then going through each street in the tract from north to south and from east to west. Observers recorded each outdoor advertisement's latitude and longitude using a GPS monitor.

Each team then followed a standard protocol and used a standard data collection instrument to document the type and brand of the product advertised. This information was used to classify all the outdoor advertisements into 4 major product subcategories: alcohol, tobacco, food and/or restaurants, and other products. Observers also recorded the format of media used: 1) posters, flyers, flags, banners, or transit shelters or benches, 2) small billboards (larger than poster or banners but smaller than 12' × 24'), 3) average size billboards (12' × 24'), and 4) extra-large billboards (14' × 48'). In addition, in order to better capture double-sided billboards and multiple banners, posters, and flyers at the same advertising location, observers coded the frequency with which the ad appeared: Once, 2–4 times, 5–10 times, 11+ times. A quality control supervisor conducted separate concurrent observations in a selected number of stores and billboards in selected census tracts in both sites to ensure the reliability of observations.

Data was gathered to characterize the built environment of each of the census tracts. Using TIGER street and census tract files provided by the 2000 Census, only those street segments falling within sampled tracts were selected using ArcGIS 9.3. Then, the streets' Census Feature Class Codes (CFCC) were used to create a series of street related variables: any freeway present in the tract (CFCC=A10–A18), the number of miles of other major roads and arteries (CFCC=A20–A38), and the number of miles of local neighborhood roads, trails, etc. (all other CFCC codes).

Existing data available through ESRI StreetMap 9.3 were used to locate all local parks, schools, and churches in the study areas. Then a geographic shapefile of sampled census tracts was used to calculate the number of these facilities located within each tract and to identify all outdoor advertising locations within 500 feet these places where children were likely to be present.

All ads within 500 feet of a school, park, or church and all ads within 100 feet of a freeway or a major road were flagged. Subsequently, tract-level variables were created for the total number of tobacco ads in violation of the MSA (transit shelters/benches or billboards) and two variables to measure tract-level compliance with the OAAA Code of principles: 1) the total number of alcohol and tobacco billboards within 500 feet of a school, park, or place of worship and 2) the total number of small alcohol and tobacco ads within this same distance.

Next, data were extracted on each tract's demographic and socioeconomic characteristics from the 2000 Decennial Census. Since earlier studies had identified relationship between advertising and race and poverty, data were obtained on median household income and race/ethnicity, creating a simple indicator variable to flag neighborhoods where 50% or more of

the residents were African American or Latino. In addition, data were downloaded on the percentage of residents under 18 in each tract to control for potential over-targeting of areas with proportionally more young people by advertisers. Data on population density was also extracted since advertisers are likely to place to their ads where more people will be exposed to their messages. These census characteristics were then bench-marked against the “average” tract in Los Angeles County and the state of Louisiana respectively. Further, in order to control for variation in local outdoor advertising ordinances and enforcement, each tract’s city jurisdiction was identified.

Statistical Analyses

First, ad format, frequency, and proximity to schools, parks, churches, major roads and highways were analyzed. Then, differences in demographics, the built environment and exposure to outdoor advertising between the sampled tracts in Los Angeles County and the state of Louisiana were described. Because the sites differed significantly from each other in many ways, all subsequent analyses were stratified.

The number of tobacco ads in violation of the Master Settlement Agreement (i.e. on transit furniture and on billboards) and the number of alcohol and tobacco billboards within 500 feet of schools, parks, and churches by size (billboards vs. all other small format ads) were modeled using a 2-level random intercept hierarchical linear model with tracts nested in cities. The analyses were conducted using PROC MIXED in SAS 9.2. Level-one predictors included indicators for majority African American/Latino tracts, higher than average proportions of youth under 18, lower than average median household income, higher than average population density, and any freeway, as well as each tract’s total miles of major roadways and neighborhood streets, and number of public schools, parks, and churches. The analyses of ads proximate to schools, parks, and churches also included an indicator for tracts where no such facilities were present. The second-level consisted of the random intercept for city. Because level-one residuals were not normally distributed, the dependent variables were log-transformed, adding 1 to zero counts before transformation. Intra-class correlations were calculated in the intercept-only and full models to understand the percentage of variance explained by the random intercept for city before and after adjusting for covariates.

Results

Description of outdoor advertisements

Alcohol ads accounted for 7.8% and 4.8% of all ads in Los Angeles and Southern Louisiana respectively (data not shown). More than one in five ads in Louisiana advertised tobacco. In raw numbers, there were almost twice as many tobacco ads in Louisiana as in Los Angeles, despite the fact that there were almost 2.5 times more ads on the ground at the latter location.

Overall, compliance with the Master Settlement Agreement ban of tobacco ads on transit shelters and billboards was inconsistent in both sites (Table 1). While advertisements in Los Angeles County mostly respected ad format restrictions, more than 1 in 4 tobacco ads in Louisiana used non-compliant billboards to promote their products.

Generally speaking, tobacco advertisers relied heavily on small-format, high repetition ads. For example, more than 70% of tobacco ads appeared as banners, flyers, or flags and about two-thirds of tobacco ads in Louisiana appeared more than once, with more than 1 in 5 ads posted at least 5 times at a single location.

A substantial proportion of outdoor ads for alcohol and tobacco were located within 500 feet of a school, park, or church—37% and 25% in respectively in Los Angeles and 21% and 20% respectively in Louisiana. In Los Angeles, most ads (32% of alcohol and 22% of tobacco) clustered around churches rather than parks or schools. In Louisiana, all the alcohol ads in violation of the OAAA code of principles were located near churches.

In Los Angeles, relatively few ads were close to freeways (0.8%) or major roadways (7.7%) while about 44% of Louisiana outdoor advertising was found in close proximity to these types of streets.

Description of tracts

Sampled tracts in Los Angeles and Louisiana differed substantially from each other in terms of demographics and socioeconomic characteristics (Table 2). Forty-eight percent of Louisiana tracts were primarily African American or Latino, while 85% of Los Angeles tracts fit this description ($p<.0001$). Louisiana tracts also had a slightly smaller mean proportion of underage residents (26% versus 28%, $p=0.01$) and much lower population density—roughly 6300 persons per square mile as opposed to almost 18,000 persons per square mile in the average Los Angeles tract ($p<.0001$). There were no significant differences in median household income by site, though median income levels were slightly higher in Los Angeles.

Sampled tracts in both sites differed substantially from their surrounding areas (data not shown). Sampled tracts in Los Angeles tended to be poorer (68%), and have slightly more people per square mile (52%) and a higher percentage of youth (55%) than the average tract in the county. Sampled tracts in Louisiana were more densely populated (86%) and had proportionately smaller youth populations (59%) than the average tract in state. In addition, minority tracts accounted for a higher percentage of sampled tracts than in the county or state as a whole: 85% vs. only 56% in Los Angeles, and 48% vs. 33% in Louisiana.

On average, Los Angeles tracts had more than twice as many outdoor advertisements as tracts in Louisiana (14.6 vs. 6.5 ads per tract, $p<.001$). The proportion of tracts with at least one alcohol advertisement was twice as high in Los Angeles than Louisiana (42.1% vs 20.8%, $p<.001$), while a larger proportion of tracts in Louisiana had some sort of tobacco advertising (40% vs. 30%) though this difference was not statistically significant.

The mean number of tobacco ads in violation of the Master Settlement Agreement was slightly higher in Louisiana tracts (0.4 vs. 0.01 in Los Angeles), but there were no differences in the average number of violations to the Outdoor Advertising Association of America's ban of alcohol and tobacco advertising within 500 feet of schools, parks, or churches.

Compliance with the Master Settlement Agreement (MSA)

In Los Angeles, only population density was significantly associated with the number of transit benches/shelters in violation of the Master Settlement Agreement though the magnitude of this association was small. Tracts with more people per square mile than the average tract in Los Angeles County had 4% fewer of these violations than otherwise similar tracts. In Louisiana, city jurisdiction explained 55% of the variance in the number of tobacco billboards violations and each additional mile of major roadway was associated with 4% more tobacco billboards in each tract. Socio-demographic factors were unrelated to MSA compliance.

Compliance with the Outdoor Advertising Association of America (OAAA) Code of Principles

In Los Angeles, low-income status and the presence of a freeway in the tract were both associated with nearly 40% more alcohol and tobacco billboards in violation of the OAAA Code of Principles. In addition, the number of churches in a tract was related to slightly increased numbers of both billboards and smaller ad formats within 500 feet of schools, parks, and churches. Each additional church was associated with 6% more billboards and 5% more transit ads, posters, banners, and flyers.

In Louisiana, city jurisdiction explained large part of the variance in the number of ads near places where children were likely to be present—79% of the number of alcohol and tobacco billboards and 71% of the number of smaller ads advertising these products. Each additional mile of major roadway was also associated with 7% more small ads within 500 feet of schools, parks, or churches.

Discussion

This study suggests the advertising industry is not following through on its claim to shield children from exposure to alcohol and tobacco ads near schools, parks, and churches, especially in low-income neighborhoods in Los Angeles. These findings are not without precedent. A 1998 study of Boston neighborhoods found similar non-compliance with the 1996 Food and Drug Administration 1000-foot ban of tobacco ads near public schools and playgrounds in at-risk neighborhoods²⁰ and a recent study of alcohol outdoor advertisements in Central Harlem found that 50% fell within 500 feet of schools and churches, and 25% within 500 feet of playgrounds.²⁶ Areas near churches seem to be particularly vulnerable in both Los Angeles and southern Louisiana. These sites may be appealing to advertisers because of the large number of adults that also regularly frequent these premises.

The data also show that enforcement of the Master Settlement Agreement, particularly in Louisiana, is problematic. Because of the way the enforcement mechanism is structured, two main problems arise.²⁷ First of all, no public agencies are formally charged with monitoring tobacco companies' outdoor advertising practices which places the burden on individuals or public health organizations to report violations. Second, the States' Attorneys General are the only ones designated to investigate and prosecute violations which takes enforcement out of the hands of local officials who could deal with violations in a more timely and efficient manner. Given the wide geographic scope of outdoor advertising, states like Louisiana, which had a budget deficit of \$304 million in the year of data collection,²⁸ may simply not have the resources to make tobacco advertisers comply. In contrast, enforcement of the Tobacco Advertising and Promotion Act 2002, which outlaws tobacco outdoor advertising in the United Kingdom, is much more decentralized. The Trading Standards Service is explicitly named as the agency responsible for compliance²⁹ and 96% of central and local government organizations help enforce this law as parties to the Enforcement Concordat, an agreement that coordinates monitoring activities across jurisdictions.³⁰

Despite format restrictions imposed by the Master Settlement and steep decreases in overall outdoor advertising expenditures for tobacco products,^{1,2,31} these ads are still ubiquitous. Prohibiting large media formats like billboards, which mostly target people commuting by car, may have had the undesired effect of investments in smaller ad formats that target local communities and users of mass-transit. When displayed multiple times at a single site, small format ads can take up similar amounts of space as billboards but are located at eye-level for pedestrians. Eye-tracking studies have found that, on average, pedestrians view small outdoor advertisements like transit benches 6–7 times, totaling around 5 seconds at each exposure—almost equivalent to the views generated by traditional print media.³² In

addition, small ads lead more directly to a sales conversion if located near a business where a transaction can occur.

The fact that the presence of freeways in Los Angeles and the number of miles of major roadways in Louisiana are associated with increased numbers of alcohol and tobacco ads in violation of the Master Settlement Agreement and/or the OAAA Code of principles may well be the result of lower levels oversight in these areas. These kinds of roads are often flanked by commercial and industrial zones over which local residents are unlikely to feel ownership. Consequently, individual citizens are less likely to complain about ads in these areas and the alcohol and tobacco industries have less incentive to respect advertising guidelines.

The importance of city jurisdiction, particularly in Louisiana points to widely differing local zoning laws. One study of cities in Los Angeles County found that urban cities tend to have more liberal laws which allow billboard construction in any commercial or manufacturing zone except zones classified as light commercial, while many suburban cities restrict billboards to manufacturing zones only and require more stringent permits, etc.²¹ Variation in the Louisiana tracts is likely to be even more pronounced than in the Los Angeles tracts since the sampled tracts in Louisiana were geographically dispersed over several parishes (Louisiana's equivalent of counties).

Conclusions

Cities must be empowered to deal locally with violations of the Master Settlement Agreement in order for its mandates to be properly enforced. Voluntary commitments by advertisers to protect children from outdoor alcohol and tobacco ads posted near schools, parks, and churches are ineffective. Legislation is needed to force advertisers to honor their pledge.

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Table 1

Description of outdoor advertisements by type of product sold

	Los Angeles				Probability Chi Square	Louisiana			Probability Chi Square
	All (n=1667) %	Alcohol (n=130) %	Tobacco (n=81) %	Other (n=1456) %		All (n=686) %	Alcohol (n=33) %	Tobacco (n=154) %	
Format					<.0001				<.0001
Extra Large Billboard (14' × 48')	14.9	27.7	0.0	41.6		15.6	27.3	2.0	19.0
Average Billboard (12' × 24')	16.7	25.4	0.0	16.8		22.9	60.6	1.3	27.1
Small Billboard (<12' × 24')	21.2	35.4	0.0	21.1		22.3	9.1	25.3	22.2
Poster or flyers/flags/banners	20.5	8.5	98.8	17.2		33.5	0.0	71.4	24.1
Transit shelter or bench	26.8	3.1	1.2	30.4		5.7	3.0	0.0	7.6
Frequency of ad at location					<.0001				<.0001
Once	84.3	91.5	70.4	84.5		59.5	97.0	11.0	71.9
2-4 times	10.5	4.6	27.2	10.1		31.2	3.0	65.6	22.4
5-10 times	2.1	1.5	0.0	2.3		7.9	0.0	21.4	4.2
11+ times	3.1	2.3	2.5	3.2		1.5	0.0	2.0	1.4
Proximity to children									
Within 500 ft of a school	4.3	6.2	2.5	4.2	0.41	5.7	0.0	9.1	5.0
Within 500 ft of a park	4.9	2.3	2.5	5.3	0.19	2.6	0.0	1.3	3.2
Within 500 ft of a church	30.1	32.3	22.2	30.4	0.25	9.8	21.2	9.1	9.2
Within 500 ft of a school, park, or church	36.6	36.9	24.7	36.1	0.11	16.8	21.2	19.5	15.6
Proximity to roads									
Within 100 ft of a freeway	0.9	0.8	0.0	1.0	0.66	3.2	0.0	0.0	4.4
Within 100 ft of a major road	8.6	9.2	12.4	8.4	0.45	40.7	45.5	31.2	43.3

Note: Bold print indicates illegal outdoor advertising format

Table 2

Comparison of sampled tracts in Los Angeles and Louisiana counties

Tract Characteristic	Total (n=220)	Los Angeles (n=114)	Louisiana (n=106)
Demographics and Economic Status			
% African-American, Hispanic, or racially mixed tracts ⁺⁺⁺	67.3	85.1	48.1
Mean % of Youth under 18 (Std Dev) ^{**}	26.8 (0.08)	28.1 (0.08)	25.5 (0.07)
Mean Median Household Income (Std Dev)	\$37,871 (\$21,331)	\$40,003 (\$25,221)	\$35,579 (\$15,946)
Mean persons per square mile (Std Dev) ^{***}	12,279 (12,212)	17,833 (14,653)	6306 (3,240)
Road structure and neighborhood features			
Mean miles of neighborhood streets (Std Dev)	10.6 (7.6)	7.4 (4.7)	14.1 (8.6)
Mean miles of major arterial roads (Std Dev) ^{***}	0.6 (1.3)	0.2 (0.3)	1.1 (1.7)
% Any Freeway	19.1	21.1	17.0
Mean parks (Std Dev)	1.6 (1.5)	1.5 (1.4)	1.6 (1.6)
Mean schools (Std Dev) ^{***}	1.4 (1.3)	1.1 (1.0)	1.7 (1.5)
Mean places of worship (Std Dev) ^{***}	1.7 (2.4)	1.0 (1.5)	2.5 (2.9)
Outdoor advertising			
Mean number of outdoor ad locations (Std Dev) ^{**}	16.9 (31.1)	21.9 (38.7)	11.5 (18.7)
% Any tobacco ads	34.6	29.8	39.6
% Any alcohol ads ⁺⁺⁺	31.8	42.1	20.8
Mean number of tobacco ads in violation of the Master Settlement Agreement ^{***}	0.2 (0.9)	0.01 (0.1)	0.4 (1.2)
Mean number of alcohol or tobacco ads within 500 feet of a school, park, or church			
Billboards	0.3 (1.0)	0.4 (1.0)	0.2 (1.0)
Small ads	0.2 (0.7)	0.2 (0.7)	0.2 (0.6)

|p| of t<=0.001,

**
|p| of t<=0.01,

*
|p| of t<=0.05

+++
|p| of Chi square<=0.001

Table 3

Non-compliance with Tobacco Master Settlement Agreement: Predicting the number of unauthorized tobacco billboards and transit shelter/bench ads

	Los Angeles	Louisiana
Intercept	0.03 (-0.04, 0.10)	0.14 (-0.37, 1.05)
Minority	0.00 (-0.05, 0.05)	0.11 (-0.13, 0.42)
Low income	0.01 (-0.02, 0.05)	-0.11 (-0.31, 0.15)
High youth population	0.01 (-0.02, 0.05)	-0.06 (-0.24, 0.17)
High population density	-0.04* (-0.07, 0.00)	0.21 (-0.11, 0.63)
Number of parks	0.00 (-0.02, 0.02)	0.01 (-0.07, 0.10)
Number of schools	0.01 (-0.01, 0.02)	0.00 (-0.07, 0.08)
Number of places of worship	0.00 (-0.01, 0.01)	-0.02 (-0.06, 0.02)
Number of major roadway miles	-0.01 (-0.05, 0.03)	0.04*** (-0.03, 0.12)
Number of neighborhood streets	0.00 (-0.01, 0.00)	0.01 (-0.01, 0.02)
Any freeway	-0.02 (-0.05, 0.01)	-0.03 (-0.23, 0.23)
Amount of variance accounted for by city	0.00	0.55

Non-compliance with the Outdoor Advertising Association of America (OAAA) Code of Principles Predicting the number of alcohol and tobacco ads within 500 feet of schools, parks, and churches

	Los Angeles		Louisiana	
	Billboards	Small Ads	Billboards	Small Ads
Intercept	-0.13 (-0.41, 0.29)	0.04 (-0.26, 0.46)	0.29 (-0.24, 1.18)	0.19 (-0.15, 0.67)
Minority	-0.14 (-0.35, 0.13)	-0.07 (-0.27, 0.19)	0.01 (-0.16, 0.22)	-0.04 (-0.15, 0.09)
Low income	0.39** (0.11, 0.73)	0.10 (-0.10, 0.33)	-0.09 (-0.24, 0.10)	-0.07 (-0.18, 0.07)
High youth population	-0.07 (-0.23, 0.12)	0.01 (-0.15, 0.19)	0.01 (-0.14, 0.19)	0.02 (-0.08, 0.14)
High population density	-0.01 (-0.19, 0.20)	-0.07 (-0.22, 0.10)	0.05 (-0.16, 0.31)	0.06 (-0.09, 0.24)
Number of parks	-0.02 (-0.13, 0.10)	-0.08 (-0.17, 0.02)	0.01 (-0.05, 0.08)	0.00 (-0.04, 0.04)
Number of schools	0.00 (-0.08, 0.09)	-0.04 (-0.11, 0.04)	0.02 (-0.03, 0.08)	0.03 (-0.01, 0.07)
Number of places of worship	0.06* (0.00, 0.11)	0.05* (0.00, 0.10)	0.01 (-0.02, 0.04)	0.01 (-0.01, 0.03)
No schools, parks, or churches	-0.19 (-0.36, 0.02)	-0.13 (-0.29, 0.07)	-0.04 (-0.26, 0.25)	0.00 (-0.17, 0.21)

Non-compliance with the Outdoor Advertising Association of America (OAAA) Code of Principles Predicting the number of alcohol and tobacco ads within 500 feet of schools, parks, and churches

	Los Angeles		Louisiana	
	Billboards	Small Ads	Billboards	Small Ads
Number of major roadway miles	0.07 (−0.16, 0.35)	−0.02 (−0.21, 0.20)	0.03 (−0.02, 0.09)	0.07*** (0.04, 0.11)
Number of neighborhood streets	0.01 (−0.01, 0.04)	0.02 (0.00, 0.04)	−0.01 (−0.02, 0.00)	0.00 (−0.01, 0.00)
Any freeway	0.39*** (0.15, 0.69)	0.05 (−0.12, 0.24)	−0.09 (−0.23, 0.09)	−0.07 (−0.18, 0.04)
Amount of variance accounted for by city	0.08	0.05	0.79	0.71

p<.001,

**
p<.01,

*
p<.05

p<.001,

**
p<.01,

*
p<.05

a. Because first-level residuals were not normally distributed, we log-transformed the dependent variable, making all coefficients for fixed effects percent changes in the number of ad locations