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Targeting Hispanic adolescents with outdoor food & beverage advertising around schools.

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Abstract

Objectives: Although some research has focused on the food environment and food marketing, little has examined outdoor food and beverage (FB) advertising, particularly its relationship to the Hispanic composition in schools. Therefore, the purpose of this study was to determine if the prevalence of outdoor FB advertising was greater around middle and high schools with a majority Hispanic population as compared to schools with a lower Hispanic population.

Design: All FB advertisements located within a half-mile of 47 schools in Central Texas were documented. Advertisements were coded as free standing or on establishments. Advertisements were coded for theme including price (emphasizing price) and deals/value meals (promoting discounted price/meal deals). These two themes were combined to create an overall price promotion variable. In order to determine if the prevalence of FB advertising varied by the Hispanic composition of the students in the school, data from the Texas Education Agency was used to create a variable which dichotomized the schools into two groups: schools that reported 60% Hispanic students or “Hispanic schools” (n=21) and schools that reported <60% Hispanic students or “non-Hispanic schools” (n=26). Linear regression analyses were conducted to determine if the prevalence of outdoor FB advertising was greater around Hispanic schools as compared to non-Hispanic schools.

Results: Hispanic schools had more overall outdoor FB advertisements as compared to non-Hispanic schools ($p=0.02$). Similarly, we found significantly more outdoor FB establishment ($p=0.02$) and price promotion ($p=0.05$) around Hispanic schools as compared to non-Hispanic schools. Differences in freestanding advertisements by school type approached significance ($p=0.07$) with Hispanic schools having more freestanding FB advertisements on average.

Conclusion: Further research is needed that documents the content of these advertisements and determines the extent to which these advertisements affect Hispanic and other racial/ethnic minority youth’s attitudes and behaviors toward the consumption of these products.

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Keywords

Hispanic; Outdoor Advertising; Schools; Disparities; Food and Beverage; Marketing

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1. Introduction

Childhood obesity rates have more than doubled among children and quadrupled among adolescents in the past 30 years (Centers for Disease Control and Prevention [CDC] 2014). Significant racial disparities persist as overweight and obesity rates tend to be higher and have increased more rapidly among Hispanics (Ogden et al. 2014). Childhood obesity is of particular importance in Texas, where one in three Texan children is overweight or obese (Aarons 2011). In Texas, the prevalence of obesity is higher among Hispanic children (46.8 percent) compared to non-Hispanic white children (22.9 percent) (Child Health Data 2007). Although there are many factors that contribute to childhood obesity, a growing body of scientific evidence suggests the marketing of unhealthy food to children is a significant risk factor contributing to this epidemic (Kunkel et al. 2009; Institute of Medicine [IOM] 2006). Furthermore, studies indicate that food marketing aggressively targets vulnerable groups such as low-income and minority youth, including Hispanics, as food and beverage marketing to these groups is less likely to promote healthy eating (Story and French 2004; Adeigbe et al. 2015).

Food marketing may serve as an environmental cue that subconsciously triggers purchase and consumption behaviors without directly affecting food attitudes and beliefs (Bargh and Ferguson 2000). Moreover, exposure to food marketing influences preferences and purchase requests of children and may contribute to higher consumption of unhealthy foods, thus negatively impacting their health (Grier and Kumanyika 2010). Mass marketing campaigns work to create an environment that continually exposes children to calorie-dense, high-fat, low-nutrient foods and beverages. According to a recent follow-up report conducted by the Federal Trade Commission (FTC), businesses spent \$1.79 billion on youth marketing, with 72 percent of that spending used to promote fast foods, soft drinks and sugared breakfast cereals (FTC 2012). Furthermore, studies suggest these foods and beverages are promoted to children and youth through a variety of media channels, including television (Boyland and Halford 2013), children's websites (Chester and Montgomery, 2007), magazines (Cowburn and Boxer 2007) and other non-broadcast mediums. Previous research has found that greater exposure to fast food marketing and lower fast food prices is associated with greater fast food consumption and higher body weight among children and adolescents (Andreyeva et al. 2011; Powell and Chiqui 2011). While television food advertising accounts for the largest proportion of industry spending (IOM 2006), there is a lack of research on outdoor food and beverage advertising.

Outdoor advertising in the form of billboards, posters, and other signage is a marketing strategy that has the potential to influence the commercial food landscape (Kelly et al. 2008). It is a relatively inexpensive method with high potential impact, as children tend to view the same messages regularly, thereby receiving repeated exposure (Luke et al. 2000). The vast majority of fast food restaurants and convenience stores across the U.S. have

exterior outdoor advertising on their building or property. Previous research has shown that price and value promotions were more likely to be featured on outdoor signage than on signs at the counter (Harris et al. 2010). Price promotions highlight a key feature of these foods, namely, that they are a relatively inexpensive source of calories by emphasizing the convenience, taste, and low cost of fast food (Kunkel et al. 2009). Moreover, a systematic review of fast food access studies indicated that fast food restaurants and convenience stores have been found to be more common in ethnic minority neighborhoods (Fleischhacker et al. 2011). The vast majority of fast food restaurants tend to promote their products through exterior marketing, and evidence suggests that Hispanics as well as low-income populations are more likely to be exposed to outdoor advertising for unhealthy foods as compared to whites (Grier and Kumanyika 2008; Yancey et al. 2009). Furthermore, as the Hispanic population in Texas continues to grow (US Census 2010), many marketers may be capitalizing and focusing their marketing efforts toward this group.

Limited research has documented the adverse effects of targeted alcohol advertising on youth behaviors and intentions (Pasch et al. 2007). Previous research on the impact of outdoor alcohol advertising suggests that increased exposure to alcohol advertising around schools is associated with adolescents' intentions to use alcohol (Pasch et al. 2007). Similarly, increased awareness of cigarette billboard advertising was associated with a higher smoking incidence and an increased risk of children becoming smokers (Lopez et al. 2004). While numerous studies have examined the density of food outlets around schools and its relationship with obesity and diet quality (Austin et al. 2005; Kipke et al. 2007; Simon et al. 2008; Zenk and Powell 2008; Davis and Carpenter 2009; Larson and Story 2009; Laska et al. 2010; Babey et al. 2011; Buck et al. 2013), few have focused on outdoor food and beverage advertising around schools (Grier and Kumanyika 2008; Yancey et al. 2009). Furthermore, there is limited evidence documenting outdoor food and beverage advertising around majority ethnic minority schools. Given that previous research has documented the influence of tobacco and alcohol advertising around schools in ethnic minority neighborhoods on adolescents' intentions to use those products, it is possible that the increased exposure to outdoor food and beverage advertising may influence Hispanic adolescents' food choices and ultimately their health outcomes. This association may help explain the disparities in obesity rates among Texan youth. Thus, the purpose of this study was to determine if the prevalence of outdoor food and beverage advertising was greater among middle and high schools with a majority Hispanic population as compared to schools with a lower Hispanic population.

2. Methods

This study used data collected for the Outdoor MEDIA (Measuring and Evaluating the Determinants and Influence of Advertising) study, which was designed to document and describe the prevalence of outdoor food and beverage (FB) advertising around middle, high schools, and hospitals in Central Texas (Pasch and Poulos 2013; Poulos and Pasch 2015). All FB advertisements located within a half-mile of 34 middle and 13 high schools in Central Texas were documented.

2.1 Data Collection

Data collectors objectively documented descriptive information and took a photo of each FB advertisement within a half-mile radius of each school using a validated electronic tool (Pasch and Poulos 2013; Poulos and Pasch 2015). A half-mile radius was chosen for two reasons: 1) an extensive review of the literature suggested that the mean size of buffers used should be 904 meters (Austin et al. 2005; Maher et al. 2005; Kipke et al. 2007; Kelly et al. 2008; Simon et al. 2008; Zenk and Powell 2008; Davis and Carpenter 2009; Hillier et al. 2009; Walton et al. 2009; Adams et al. 2011; Day and Pierce, 2011) however, given that 904 meters or 0.56 miles was not considered a practical metric, a half-mile, which is approximately 800 meters was chosen instead, 2) this distance is a reasonable distance for a middle or high school student to walk from their campus to purchase food or drink from a nearby outlet. Several studies have found that fast food restaurants and convenience stores are systematically concentrated within a short walking distance of middle and high schools (Austin et al. 2005; Zenk and Powell 2008; Davis and Carpenter 2009). See Pasch and Poulos (2013) and Poulos and Pasch (2015) for more detail on data collection methodology.

2.2 Coding

Advertisements were coded as freestanding or on an establishment. Any signage promoting food or beverage that was not directly placed on the establishment building (i.e. signs on gas pumps, sidewalks, A-frames, banners, billboards) was coded as a “free standing advertisement”. Conversely, any signage promoting food or beverage that was directly placed on the windows or walls of the establishment was coded as an “establishment advertisement”.

2.3 Price Promotion

Advertisements were then coded for theme, including “Price” or “Deals/Value Meals”. “Price” was defined as an advertisement that emphasized price, for example, that you could get a product for XX dollars/cents. “Deals or Value meals” was defined as an advertisement that promoted discounted sales of products and/or used language suggesting that something was on sale or on special. This type of advertisement was considered different from “Price” in that this type of advertisement may not mention price specifically, but rather used language to convey a specific promotion. These two themes were counted together to create an overall “Price Promotion” variable. These types of advertisements could be either freestanding or establishment ads.

Inter-rater reliability analyses were conducted for the two types of data collected. The first type documented the presence of advertisement type (advertisement, establishment advertisement, or establishment) and second types documented the descriptive details of each advertisement. Percent agreements were calculated for the overall tool reliability using a custom formula in FileMaker. Reliability was high overall for both type 1 (presence of advertisement) (0.71, SE=0.45) and type 2 (content of advertisement) (0.84, SE=0.22). In addition, the mean percent agreement between coders for descriptive coding and theme coding was also high at 91.2% (SD=0.02) and 86% (SE=0.04) respectively.

2.4 Hispanic School

In order to determine if the prevalence of FB advertising varied by the Hispanic composition of the students in the school, demographic data from the Texas Education Agency was used to create a variable which dichotomized the schools into two groups: schools that reported having more Hispanic students than non-Hispanic white students termed, “Hispanic” schools and schools that reported having less Hispanic students than non-White Hispanic students or “Non-Hispanic” schools. The Texas Education Agency defined ‘Hispanic’ as a ‘person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of “race” (Texas Education Agency 2010). Three cut points were created based on the percentage of Hispanic students (40%, 50%, and 60%). It was determined that the 60% cut point yielded a more evenly distributed sample of schools with 21 “Hispanic” schools with 60% Hispanic students and 26 “non-Hispanic” with <60% Hispanic students.

2.5 Data Analysis

SPSS Version 21 (SPSS 2012) was used to create frequency tables of the total counts and mean numbers of the following: freestanding, establishment, price promotion and total outdoor FB advertisements. To determine if there were significantly more total outdoor FB advertisements around predominantly Hispanic schools, linear regression analyses were conducted. This procedure was repeated with FB establishment advertisements, freestanding advertisements, and price promotion advertisements.

3. Results

A total of 47 schools were included in the analysis (see Table 1 for demographic information). Schools with 60% or more Hispanic students had an average of 76% Hispanic students out of their total student population. Over 80% of those students were eligible for free or reduced priced lunch.

We observed a number of notable differences in the total numbers and means in the types of FB advertisements between Hispanic schools (i.e. 60% Hispanic students) and non-Hispanic schools (i.e. <60% Hispanic students). Overall, schools with 60% or more Hispanic students had significantly greater numbers of establishment, price promotion and total FB advertisements around their schools within the half-mile radius (see Table 2).

Focusing on advertisements by category (freestanding v. establishment), youth attending schools with 60% or more Hispanic students had more freestanding advertisements; however, this difference was not statistically significant (see Table 3). Youth attending schools with 60% or more Hispanic students were exposed to significantly more establishment advertisements than youth in schools with less than 60% Hispanic students (see Table 3). Specifically, adolescents attending schools with 60% or more Hispanics were exposed to, on average, 60 more establishment FB advertisements as compared to youth in schools with less than 60% Hispanic students (see Table 3).

Regarding FB price promotion advertisements, youth in schools with 60% or more Hispanic students were exposed to significantly more price promotion advertisements for food and beverage compared to youth in schools with less than 60% Hispanic students (see Table 3).

Youth attending schools with 60% or more Hispanic students were exposed to, on average, 18 more price promotion FB advertisements as compared to youth attending schools with less than 60% Hispanic students (see Table 3).

Finally, youth in schools with 60% or more Hispanic students saw significantly more total advertisements for food and beverage compared to youth attending schools with less than 60% Hispanic students (see Table 3). Youth attending schools with 60% or more Hispanic students were exposed to, on average, 95 more total FB advertisements as compared to youth attending schools with less than 60% Hispanic students (see Table 3).

4. Discussion

Outdoor food and beverage advertisements were more prevalent around schools with a higher Hispanic population. Youth attending schools with a greater percentage of Hispanic students were exposed to greater amounts of outdoor FB advertising than youth attending schools with fewer Hispanic students. This is particularly problematic as a majority of these advertisements were for calorie-dense, high-fat, low-nutrient food or beverage products (e.g. fast food and sugar sweetened beverages). Thus, the current study adds to the current limited literature that suggests commercial marketing companies may be targeting Hispanics (Grier and Kumanyika 2010; Kunkel et al. 2009; Adeigbe et al. 2015), particularly low-income Hispanics (Grier and Kumanyika 2008; Yancey et al. 2009). Considering that advertised food and beverage products are known to influence food choice (Booth et al. 2005; IOM 2006), these advertisements may pose a challenge for healthy-eating messages and may contribute to poor dietary behaviors by providing visual cues that trigger purchase and consumption behaviors automatically, without directly affecting food attitude and beliefs (Bargh and Ferguson 2000). Existing evidence indicates that the pervasive targeted marketing of unhealthy food products towards African American youth is largely effective as it can lead to higher levels of consumption and contribute to childhood obesity (Grier and Kumanyika 2010). Although studies have documented the high levels of calorie-dense, high-fat, low-nutrient food promoted to youth in general (Chester and Montgomery 2007; Cowburn and Boxer 2007; Finkelstein et al. 2008), there is limited research on the targeting of Hispanic youth by food and beverage marketing.

The concentration of outdoor food and beverage advertisements around middle and high schools, whether intentionally or inadvertently, suggests that adolescents are heavily exposed to these advertisements. Furthermore, it is very likely that adolescents are also being exposed to these messages through other forms of media in addition to outdoor advertisements, including television (Powell et al. 2014), internet (Story and French, 2004), radio (Gallo 1999) and magazines (Cowburn and Boxer 2007), thereby creating a saturated environment. As such, this increased exposure may lead adolescents to believe that the over-consumption of these unhealthy foods is normative and does not lead to negative health outcomes. A study conducted by Beaudoin (2014) on the effects of unhealthy food advertising among adolescents found that as adolescents age, they spend more time away from home, and thus are exposed to more external influences, including advertising that can impact their dietary behaviors through normative influence. Future research should

investigate the positive and negative influence of social norms and its impact on food choice and food intake.

While research focused on understanding how food and beverage advertising targets Hispanics is still in its initial stages, the results of this study are in line with previous work, which suggest that unhealthy food advertisements are more prevalent in communities with greater minority populations (Story and French 2004). Further, students in schools with 60% or more Hispanic students were also more likely to be eligible for free or reduced priced lunch (FRL) as compared to students in schools with less than 60% Hispanic students, suggesting that outdoor food and beverage advertising may also be more prevalent in lower socioeconomic areas. FRL is often used by researchers as a proxy for socioeconomic status (Nicholson et al. 2014) and studies suggest that low-income youth are at excess risk of obesity as research has found that those with lower SES tend to consume higher amounts of calorie-dense, nutrient poor foods such as sugar sweetened beverages, sodium and fats (Darmon and Drewnowski 2008). Furthermore, research has demonstrated that socioeconomic status is an important determinant of many health behaviors and can influence related health outcomes (Goodman et al. 2003). Therefore, while childhood obesity is a national problem, we know that factors such as age, SES, and culture can influence food choices. Thus, it will be important to examine the interplay of marketing, SES and Hispanic culture. Finally, as adolescents live in a world saturated with advertisements from a variety of marketing channels, research on the exploration of how multiple exposures influence dietary behaviors among Hispanics and other minority youth is needed.

The findings have implications for practice and policy. First, it raises questions regarding the targeted marketing practices of food and beverage companies. Kramer et al. (2013) found that targeted marketing may be particularly effective with ethnic minority youth as adolescence tends to be a time when youth are not only developing cognitively, but they are also developing a personal and racial/ethnic identity. Studies suggest that minority youth respond more favorably to ethnically targeted marketing compared to majority youth. This is possibly due to the use of celebrities and cultural symbols of their own racial/ethnic group as they are drawn to an ad that they feel resonates with them (Grier 2009). It has even been suggested that the use of these tactics may cause minority youth to use the consumption of unhealthy foods to combat social stigma and economic marginalization (Grier 2009). This can be particularly harmful for minority adolescents as research has found that discrimination can affect self-regulatory capacity regarding food choices, thus leading to the higher consumption of unhealthy foods (Pascoe and Richman 2011). Furthermore, although targeted marketing is a fundamental marketing strategy, there is strong evidence that targeting youth with messages encouraging the consumption of low-nutrient, calorie-dense foods and beverages is strongly linked to obesity and its adverse health effects (Kramer et al. 2013, Adeigbe et al. 2015). Therefore, this marketing strategy may also raise concerns regarding issues of racial discrimination and ethics. If these findings are replicated in other locations, it can be inferred that outdoor food and beverage companies are targeting Hispanic and/or other minority youth. Therefore, in order to protect youth from unhealthy advertising near schools, zoning ordinances and other control policies limiting the amount of fast food outlets and convenience stores near schools may help limit adolescents' exposure

to unhealthy food and beverage advertising (Maantay 2001). Additionally, media literacy courses in the classroom that make youth aware of the many messages they receive daily from the media and how those messages can influence their attitudes and behaviors (Kumanyika and Grier 2006) may provide an opportunity for promoting equity and health among these vulnerable populations.

There are several strengths to this study. One strength is that food and beverage advertising was objectively documented around schools, with a focus on a feasible walking distance to and from the school. Additionally, data was collected during the school year, ensuring that advertisements documented were those that youth were more likely to be exposed. Also, there was strong inter-rater reliability of the data collection and coding tools. Further, to our knowledge, this is the first study to examine the relationship between outdoor FB advertising and Hispanic youth.

However, this study also has its limitations. The sample size was relatively small, limited to only 47 schools and region-specific (Austin, Texas metropolitan area). Future studies should consider using a nationally representative sample, along with mixed methods, multilevel and multivariate analyses to explain the relationship between race/ethnicity, geographical location, and exposure to outdoor food and beverage marketing as this would lead to more a more accurate representation of the population by increasing the external validity of the results. Additionally, as this was a cross-sectional study, it is possible that we are vastly underestimating the amount and types of advertisements considering that advertisements can be changed and updated rather quickly. Therefore, future studies should utilize a longitudinal design with multiple data collection points to determine differences over time. Finally, while youth attending schools with majority Hispanics students were exposed to higher numbers of outdoor food and beverage advertisements, we were unable to determine whether this increased exposure lead to higher consumptions levels of their products. Therefore, future research should examine the relationship between exposure and an obesity indicator such as BMI to determine whether adolescents are consuming the products they are being exposed to.

Despite these limitations, the findings of this study suggest that Hispanic youth are disproportionately exposed to outdoor food and beverage advertising around their schools. Researchers and policy makers should consider the implementation of policy interventions that strengthen marketing and advertising guidelines as well as counter-advertising campaigns to reduce the overexposure of minority youth to marketing for calorie-dense, high-fat, low nutrient foods around schools in an effort to reduce childhood obesity disparities in the U.S.

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Table 1.

Demographics of schools by percentage of Hispanic students in the schools (n=47).

	Cut Point (% Hispanic Students)	
	<60% n=26	60% n=21
Gender		
% Female	48.7	50.0
Race/Ethnicity		
% Hispanic	36.6	76.1
% African American	15.7	13.9
% White	40.7	8.4
% of students eligible to receive free or reduced priced lunch	41.9	82.8
Enrollment Size (n)	1129	945.1

Table 2:

Totals and means of FB advertisements by Hispanic school categorization (n=47).

% Hispanic Students	Number of Schools	Percent of Schools	Freestanding Ads Total (Mean)	Establishment Ads Total (Mean)	Price Promotion Ads Total (Mean)	Total Ads Total (Mean)
60%	21	55.3%	1,513 (72.1)	2,217 (100.8)	693 (33.0)	3,628 (172.8)
<60%	26	44.7%	954 (36.7)	969 (41.1)	393 (15.1)	2,025 (77.8)
Total	47	100	2,467	3,186	1,086	5,653

Table 3:

Relationship between schools with 60% Hispanic students and exposure to FB advertisements by category (n=47).

% Hispanic students	B	Std. Error	p-value
Freestanding	35.4	19.30	.07
Establishment	59.7	23.04	.02
Price Promotion	17.9	8.93	.05
Total FB	94.9	39.49	.02

* An independent model was run for each category.