Obesogenic and Youth Oriented Restaurant Marketing in Public Housing Neighborhoods

Rebecca E. Lee*, Katie M. Heinrich[2], Jacqueline Y. Reese-Smith[3], Gail R. Regan[4]

*Texas Obesity Research Center, Health and Human Performance, University of Houston, 3855 Holman Rd, Garrison Gym 104, Houston, TX 77204; 713 743 9335; releephd@yahoo.com

[2]Kansas State University, Department of Kinesiology, 1A Natatorium, Manhattan, KS 66506

[3]The University of Texas, MD Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77230

[4]Castleton State University, Department of Exercise Science, 49 College Drive, Castleton, VT 05735

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ABSTRACT

This study compared restaurant marketing (product, price, promotion) by restaurant and neighborhood type. All restaurants (61=fast food, FF; 72=table service, TS) within an 800 meter radius of 13 public housing developments (HD) and 4 comparison neighborhoods were audited using the Restaurant Assessment Tool©2010. HD neighborhoods were low income and high minority with more FF restaurants than comparison neighborhoods; density and street connectivity were similar across neighborhoods. Beverages were significantly cheaper at FF restaurants. HD neighborhoods had significantly lower ratios of healthy to total entrees. FF

restaurants had more children's meals, supersize drinks, free prize with purchase, supersize food items, special characters, and items geared to driving. Children's meals (27.9%) were most commonly found, followed by supersize drinks (20.6%), free prize with purchase (16.9%) and supersize foods (14.1%). Residents of lower SES neighborhoods may be differentially exposed to an obesogenic food environment particularly if there are few alternatives to FF restaurants.

INTRODUCTION

Dining outside of the home has increased in recent decades, [2] and tends to be associated with increased consumption of food, [3-6] in part, because of successful Point of Purchase (POP) marketing. The retail food outlet, a store or restaurant, is referred to as the POP, the place where food is purchased by the consumer. [1] POP marketing is used to stimulate trial, purchase and consumption of foods and beverages and is often linked to marketing in other media. Diners may be stimulated to eat more calories as a result of effective POP marketing features such as larger portion sizes. They may try foods they might not eat at home because of promotional campaigns or discount pricing, [7] and eat a less than optimal diet because of added fats, salts and sugars during preparation. [6] Living in an area where there is greater access to restaurants—particularly fast food—may contribute to eating out of the home more frequently, increasing risk for obesity and contributing to disparities in subgroups of the population. [8-10] Greater exposure to foods tends to increase the probability that they will be consumed more often, [11-13] putting frequent diners at higher risk for poorer quality dietary habits and weight gain.

POP marketing includes the product itself, the price of the product, where the product is placed, and specific promotion of the product. [1] In the case of restaurants, POP marketing that focuses on the product involves features of the food itself such as color, flavor, shape, presentation and serving size. The price of the product to the consumer involves not only the listed price, but also additional costs that may be involved (e.g., transportation) in obtaining the product. Placement refers not only to where the food is located in the restaurant, but also to where the restaurant is located in the neighborhood. Promotion refers to special product

features that encourage trial and sale, such as inclusion of licensed characters or toys, or bundling of products together. These “Four Ps” of marketing work together to influence purchase and consumption, particularly where dining outside of the home is concerned.

POP marketing is very important for increasing consumption. For example, according to a report in 2008, food companies spent in excess of $195 million to reach children and adolescents at the POP, or 12% of their youth-targeted marketing expenses (second only to television advertising). [14] Children who watch more television and eat more frequently in fast food restaurants tend to prefer larger portion sizes. [15] Eating in fast food restaurants is associated with poorer dietary quality (more French fries and fewer vegetables). [16] Previous research on POP marketing for beverages suggests that it is an effective and vital strategy for increasing consumption. [17,18] Neighborhoods with lower socioeconomic status (SES) and more ethnic minority residents tend to have fewer healthful food options and more fast food available, [10,19,20] which may be accompanied by greater exposure to POP marketing. [21]

Although POP marketing is widely used, and other studies have suggested that there is differential food availability and marketing in lower SES and minority neighborhoods, few studies have systematically investigated this relationship in restaurants. Given the documented relationship between dining in restaurants and declines in dietary quality with corresponding increases in obesity, there is a need to understand obesogenic POP marketing. This study aimed to define and document obesogenic POP marketing elements in restaurants focusing on the food product itself, pricing, promotion and placement of restaurants, as part of a larger study investigating the relationship of neighborhood factors to health habits. [19,22-27] We compared the availability and price of healthy beverages, the ratio of healthy to total entrees and obesogenic

promotion materials by restaurant type (fast food vs. table service) and neighborhood type (lower SES, high minority vs. higher SES, low minority population).

METHODS

Neighborhoods

Seventeen urban neighborhoods, defined as the area within an 800-meter radius buffer around a centroid structure of a public housing development (HD, *N*=13) or similar non-subsidized multiunit housing (*N*=4), were selected for observation. HDs offered affordable rental housing for families, seniors and persons with disabilities that were federally subsidized and managed by the local housing authority. All HD neighborhoods were located in urban areas that were predominantly lower SES, with higher proportions of ethnic minorities. The four comparison neighborhoods were also urban with similar population density and connectivity, but were higher in income with low proportions of ethnic minorities. Comparison neighborhoods were selected to have high numbers of goods and services in order to provide an adequate comparison of the types, quality and cost of available healthful foods. Detailed selection criteria and neighborhood characteristics have been described previously. [19,22-27]

Measures

The census of restaurants available to the general public was identified using a three step strategy. First, internet and telephone book searches were performed to generate an initial list of all restaurants in each neighborhood. Stores were mapped using ArcView, and researchers confirmed by phone the location and whether they were still in business. Next, trained field coders conducted windshield drive-by surveys to confirm restaurant locations and to identify additional restaurants not identified by existing databases. [22]

United States Census data were used to compute the aggregate median household income, population density and percentage of ethnic minorities for each neighborhood. All variables were drawn in aggregated form at the census block group level. [28] Values were calculated as weighted sums based on the overlap of housing development neighborhood buffer boundaries and block group boundaries as described previously. [27] Population density was the number of people per square kilometer in each neighborhood. Proportion (reported as a percentage) of ethnic minorities was calculated as the sum of people identifying themselves as non-Hispanic Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; some other race; or Hispanic, divided by the total population in that neighborhood. Street connectivity was calculated by counting the number of three or more street intersections in each neighborhood. [29]

Restaurant Assessments

The Restaurant Assessment Tool (©2010; RAT); [22] was developed over a nine month period, pilot tested, and revised for use in this study to measure key indicators of the food environment as a rapid assessment, one page tool for use in restaurants. The RAT measures the type of restaurant, and marketing related to the product of healthy food options, price and promotion materials. For this study, placement was measured as the location of the restaurant by neighborhood. Data were collected by teams of two trained field coders who were graduate students in psychology. Direct observations were made of the inside and outside of each restaurant during daylight hours, using operational definitions and carefully specified protocols (publicly available at http://www.hhp.uh.edu/undo).

Researchers coded the availability and price of beverages that were lower in calories or that might provide important nutritional benefits, including non-fat or low-fat milk, orange juice, and reduced calorie “diet” soda. Coders also counted all entrees that were operationalized as healthy. Entrees included foods that were offered with accompanying side dishes, and also included burritos, sandwiches and entrée salads. Healthy entrees included fruit or vegetable salads, dishes that were not fried, whole grain pasta or rice dishes, lean meat, seafood or vegetarian sandwiches, and other fish, poultry, egg or meat dishes that were not fried.

Promotion materials that were specifically obesogenic or targeting children were assessed in each restaurant and included special children’s meals, presence of supersize drinks, a free toy or prize available with purchase, supersize food items, table tents, special marketing characters (e.g., Ronald McDonald), and items sized to fit in an automobile cup holder. Materials that were selected as especially obesogenic may promote over-consumption of foods that have greater calorie density and reduced nutritional density (e.g., supersize drinks), or may promote mindless over consumption in the absence of hunger (e.g., French fries in a cup that fits in an automobile cup-holder).

Restaurant types included fast food (orders are taken at the counter or from a car, no table service), buffet (food is displayed in a central location for customers to serve themselves), table service (orders are taken by a server who comes to the table), and other (any other type of restaurant). For the current sample, buffet and other restaurants were eliminated from analyses due to very low sample sizes.

Ten percent of restaurants were randomly selected from the census of restaurants for an overlap reliability sample. Field coders completed overlap reliability sample measurements on separate days from the original census sample.

Statistical Analyses

First, descriptive statistics were computed to describe neighborhoods, restaurants, and marketing items. Next, kappa agreement and Pearson correlation statistics were computed to assess interrater reliability on the 10% overlap sample of restaurants (n = 15) within four months of the first assessment. Healthy beverage availability was compared by neighborhood and restaurant types using percentages. The price per ounce of skim/low-fat milk, orange juice, and diet soda was calculated based on the price and size of a large drink; statistical comparisons were made between neighborhood and restaurant types using independent samples t-tests. Ratios of healthy entrees to total entrees were calculated for each individual restaurant, based on the total counts of each. Entrée counts and ratios were compared by type of neighborhood and restaurant using independent samples t-tests. Promotional items were compared by restaurant type using chi-square analyses.

RESULTS

Neighborhood characteristics and restaurant types. As presented in *Table 1* there were significant disparities between housing development neighborhoods on dimensions of median household income and minority population, while population density and street connectivity were similar. Across all neighborhoods, a total of 136 restaurants were assessed, including 61 fast food and 72 table service. Of these, 73 restaurants were found in housing development neighborhoods, and 63 were in comparison neighborhoods. One buffet and one “other”

restaurant were found in housing development neighborhoods and two "other" restaurants were found in comparison neighborhoods, but these were excluded from analyses.

Table 1. Neighborhood characteristics and restaurant type by neighborhood type

	Housing Development *M* (*SD*) *Range*	Comparison *M* (*SD*) *Range*
Median household income	$22,871 ($7,004) $11,930–$34,303	$42,364 ($4,493) $38,099–$48,383
Population density	1,541 (534) 881–2,761	1,508 (328) 1,079–1,824
Ethnic minority population	71.4% (14.3%) 50.7%–98.1%	13.2% (4.1%) 9.1%–18.2%
Street intersection connectivity	89.2 (24.2) 50–138	101 (6.3) 93–107
	n	*n*
Fast food restaurants	36	25
Table service restaurants	36	36

Healthy Beverages. Fewer fast food restaurants had each beverage type than did table service restaurants; 100% (*n* = 72) of table service versus 96.7% (*n* = 58) of fast food restaurants had diet soda (χ^2=2.437, *p*=.119); 51.4% (*n* = 37) of table service versus 33.3% (*n* = 20) of fast food had orange juice (χ^2=4.349, *p*=.037); and 44.4% (*n* = 32) of table service versus 33.3% (*n* = 20) of fast food had skim/lowfat milk (χ^2=1.692, *p*=.193). There were no statistically significant differences by neighborhood type. Almost all restaurants had diet soda (HD = 98.6%, *n* = 70; comparison = 98.4%, *n* = 60; χ^2=0.012, *p*=.914), over a third had orange juice (HD = 45.1%, *n* = 32; comparison = 41.0%, *n* = 25; χ^2=0.223, *p*=.636), and over one third had skim/lowfat milk (HD = 39.4%, *n* = 28; comparison = 39.3%, *n* = 24; χ^2=0.000, *p*=.991).

The price per ounce of diet soda was the lowest (*M*=$0.06, *SD* = $0.02); both skim/lowfat milk and orange juice each cost an average of $0.10 (*SD* = $0.04) per ounce. Table 2 presents the price per ounce of each healthy beverage by restaurant and neighborhood type. Independent samples t-tests showed that diet soda (*t*(128) = -6.328, *p*=.000), orange juice (*t*(55) = -2.585, *p*=.012) and milk (*t*(49) = -2.764, *p*=.008) prices were significantly lower at fast food compared to table service restaurants. Comparisons by neighborhood were not significant.

Table 2. Comparison of Healthy Beverage Prices per Ounce by Restaurant and Neighborhood Types

	Diet Soda *M* per Ounce (sd)	Orange Juice *M* per Ounce (sd)	Skim/Lowfat Milk *M* per Ounce (sd)
Restaurant Type			
Fast Food	$0.051 ($0.01)	$0.085 ($0.03)	$0.078 ($0.02)
Table Service	$0.075 ($0.03)***	$0.115 ($0.05)*	$0.111 ($0.05)**
Neighborhood Type			
Housing Development	$0.063 ($0.03)	$0.102 ($0.05)	$0.098 ($0.05)
Comparison	$0.065 ($0.02)	$0.107 ($0.04)	$0.099 ($0.03)

*p<.05, **p<.01, ***p<.001

Pearson correlations were computed for the price per ounce of orange juice *(*r=.566, p=.143), skim/lowfat milk (*r*=1.0, *p*<.001), and diet soda (*r*=.868*, p*<.001) between the original sample and the reliability overlap sample. The lower reliability on the price of orange juice may reflect rater variability or simply greater price variation in orange juice compared to milk and diet soda.

Ratio of healthy entrées to total. Across all restaurants assessed, the ratio of healthy entrees ranged from 0 to 1, and almost 25% of entrees met the criteria as healthy (*M* = .24, SD = .19). On average, restaurants had 6.77 (*SD* = 9.47) healthy and 24.84 (*SD* = 18.54) total entrees. As shown in Table 3, fast food restaurants had significantly fewer healthy entrees

($t(130) = 3.10$, $p = .002$) and total entrees ($t(130) = 3.77$, $p < .001$) than table service restaurants. Counts of healthy and total entrees were similar across neighborhood types, but housing development neighborhoods had significantly lower ratios of healthy to total entrees ($t(129) = 2.04$, $p = .043$).

Table 3. Comparison of Healthy and Total Entrees by Neighborhood and Restaurant Types

	Number of Healthy Entrees	Total Number of Entrees	Ratio of Healthy to Total Entrees
Restaurant Type			
Fast Food	4.07 (4.15)	18.48 (12.37)	0.21 (0.19)
Table Service	9.03 (11.82)**	30.14 (12.08)***	0.27 (0.18)
Neighborhood Type			
Housing Development	6.14 (9.46)	25.56 (18.58)	0.21 (0.19)
Comparison	7.51 (9.50)	24.00 (18.62)	0.28 (0.18)*

*p<.05, **p<.01, ***p<.001

Pearson correlations were computed for inter-rater reliability between counts of healthy food entrees (r=.835, p<.001) and total food entrees (r=.948, p<.001), demonstrating strong agreement.

Promotional materials. Special children's meals (n=38, 27.9%) were the most commonly found item, followed by supersize drinks (n=28, 20.6%), free prize with purchase (n=23, 16.9%) and supersize food items (n=19, 14.1%). Less commonly found were table tents (n=16, 11.8%), special marketing characters (e.g., Ronald McDonald) (n = 8, 5.8%), and items sized to fit in an automobile cup holder (n=4, 2.9%).

Kappa statistics for promotional materials, including special children's meals (K=.727, p=.003), supersize drinks (K=1.0, p<.001), free prize with purchase (K=.815, p=.001), supersize food items (K=.696, p=.006), special marketing characters (K=.634, p=.008), and items sized to

fit within automobile cup holders (K=1.0, p<.001), showed strong agreement between the original sample and the reliability overlap sample. Table tents were only found at one reliability overlap sample restaurant; thus, no reliability analysis could be calculated.

Fast food restaurants typically had more promotional materials than did table restaurants. Fast food restaurants were significantly more likely to have special children's meals (71.1% versus 28.9%, χ^2=14.634, p<.001), supersize drinks (96.4% versus 3.6%, χ^2=37.918, p<.001), free prize with purchase (91.3% versus 8.7%, χ^2=24.148, p<.001), supersize food items (94.7% versus 5.3%, χ^2=22.651, p<.001), special characters (100% versus 0%, χ^2=10.451, p=.001), and items geared to driving (100% versus 0%, χ^2=5.067, p=.024). In contrast, table service restaurants were significantly more likely to have table tents (81.3% versus 18.8%, χ^2=5.822, p=.016). No statistically significant differences were found for promotional materials between housing development and comparison neighborhoods.

DISCUSSION

This study defined and documented the availability and price of healthy beverages, and the ratio of healthy to total entrees, and promotional materials in restaurants and made comparisons by restaurant and neighborhood type. We found that lower SES, higher minority population neighborhoods had about equal numbers of fast food and table service restaurants. In contrast, higher SES, lower minority population neighborhoods had fewer fast food restaurants than table service restaurants. Fast food restaurants had lower prices and less nutrient-dense foods, in particular, fewer healthful beverages and entrees. Fast food restaurants had significantly more promotional materials aimed at children that might be considered obesity promoting.

Beverages were less expensive at fast food restaurants, with diet soda costing about half the price of juice or milk. Further, diet soda was widely available, while more nutritious beverages were not as commonly available, particularly in fast food restaurants. Only about one third of fast food restaurants had juice or milk available. Food choice is affected by pricing considerations, as well as availability, [16] thus, lower priced, more widely available soda may lead to more frequent soda consumption among fast food diners. It is reasonable to assume that regular sweetened soda is available wherever diet soda is sold, and may be a more attractive choice for many. This is particularly concerning for adolescents, at least one in four of whom report eating as frequently as three or more times a week at fast food restaurants. [30]

Only about one in four entrees assessed was healthy. Fast food restaurants had fewer healthy entrees compared to table service, which may help to explain why eating at fast food restaurants is associated with poorer dietary quality. [16] Lower SES, higher minority population neighborhoods tended to have a lower ratio of healthy entree options compared to higher SES, lower minority population neighborhoods. Of the healthy entrée options assessed, the three most frequently found items were lean, non-fried meats at nearly three fourths of restaurants (77%), vegetarian entrees at almost a third (60%), and entrée salads at over half (53%). These available options may reflect consumer demand based on published guidelines, but also demonstrate a relatively narrow range of interesting and palatable options for consumers interested in more healthful options.

Previous studies have shown that people eat more calories when they eat out, both, because they are often served larger portions sizes and they may try foods not usually eaten at home, that are featured by discounted prices or enticing promotional campaigns. [7] For

example, previously reported data showed that fast food restaurants have more signage promoting unhealthy eating and overeating. [31]. The current data suggest that those who live in lower SES areas are at particular risk, because they may have more fast food restaurants compared to higher SES neighborhoods, and are therefore more likely to be exposed to promotional materials that promote poor eating options. We could not test statistically the relationship of restaurant distribution by neighborhood, because our selection criteria for the two types of neighborhood differed. However, previous work has found that lower SES neighborhoods often have fewer supermarkets or other types of retailers that sell healthful foods, and thus residents may rely more on the higher availability of fast food restaurants particularly when they employ POP marketing strategies offering energy dense food and low prices that are promoted by familiar slogans and friendly-faced characters seen previously on the television or billboard.

This scenario has no easy resolution; however, a coordinated strategy to include producers and suppliers of food along with restaurateurs and policy makers to work together could help reduce the negative impact of marketing and possibly promote healthier foods via the same marketing pathways. Restaurateurs could be encouraged to create POP marketing for lower energy, nutritionally dense foods via incentives. Regulations could be used to promote labeling of healthful foods and eliminate cross-promotions of unhealthy foods. Although this study did not verify whether orange juice was 100% juice, anecdotal reports from assessors suggested that this information was not even available, making it more difficult for consumers to make healthful beverage choices. As with successful smoking cessation campaigns, commercial food producers should eliminate pairing a licensed character (e.g. Tony the Tiger)

with unhealthy foods, but rather encourage use of licensed characters to promote specific brands of fruits, vegetables, and healthful foods in restaurants and stores. [32] Dieticians and health care providers should help to educate patients about marketing techniques used to encourage unhealthy eating patterns.

This study boasts a census sample of restaurants in a diverse, clearly defined range of neighborhoods. Additional strengths include trained assessors and a simple and reliable assessment instrument. High inter-rater reliability was achieved via careful training, on-site verification of restaurants, and detailed visual inspection of restaurants.

In conclusion, residents of lower SES, higher minority population neighborhoods may be differentially exposed to greater marketing that promotes obesity, particularly among children. These types of neighborhoods had a higher proportion of fast food to table service restaurants, and fast food restaurants had more marketing, lower prices and fewer healthful choices. Consumers may not realize that perceived monetary "value" of the typical, convenient, inexpensive fast food meal is eclipsed by the increased risk of obesity and related health compromising conditions, higher costs of health care expenditures, and reduced lifespan.

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