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Saturday Morning Television Advertisements Aired on English and Spanish Language Networks along the Texas-Mexico Border

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Saturday Morning Television Advertisements Aired on English and Spanish Language Networks along the Texas-Mexico Border

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Television (TV) viewing is hypothesized to influence childhood obesity not only by displacing physical activity with sedentary behavior in children, but also by influencing food choices via TV advertisements.; i.e., an increase in the consumption of foods of poor nutritional quality (high energy, low nutrient foods) both while watching TV and in meals and/or snacking.¹⁻⁶ While food advertisements are a large portion of all commercials aired to young audiences, an even larger percentage of all food products advertised are of poor nutritional quality such as chips, candy, and sugar-sweetened beverages.^{2,3,7-9} Results from several content analysis studies on TV commercials aired during children's programming showed that children consume 45% more food when observing food-related commercials than do those watching commercials for non-food related products or pro-nutritional public service announcements.^{2,9} Snacking items, convenience/fast food, and sweets dominate about 83% of all commercials aimed at children⁴ and 89.4% to 97.8% tend to be high in fat, sugar and sodium, all of which, if consumed on a regular basis, can lead to chronic health conditions.⁷

The American Academy of Pediatrics (AAP) recommends no more than two hours of quality media programming per day (a total of 14 hours per week) for children aged 2-17 years,¹⁰ yet according to the Nielsen Company, children aged 2-5 years spend 32 hours per week and children aged 6-11 years spend 28 hours per week on screen-time.¹¹ Well aware of children's TV viewing habits, the food industry spends \$10 billion a year on advertising, most of which is delivered via TV advertisements.¹² Gantz et al.¹³ reported that preschool children view more than 4,000 food commercials a year, (totaling approximately 30 hours). In addition, food advertisements frequently employ special marketing tactics to spark children's interest, including emotional appeals¹⁴ or fun- and action-packed footage, including animation, that features a distinct, yet persuasive, character, logo, or slogan.¹⁵

Children may also become loyal brand followers of the items they observe in the advertisements.³ Even though children may not consume the food product advertised in every commercial they view, the Social Cognitive Theory construct of vicarious (observational) learning may explain how children may indirectly learn to prefer certain food products and brand names. By viewing commercials, children may learn that certain food products have satisfying consequences, which may lead them to imitate the situation presented in the commercials.¹⁶ While Hispanics, in particular Mexican Americans, are perceived to be more brand-loyal than their non-Hispanic white counterparts,^{17,18} results from recent research indicate that brand loyalty declines as Hispanic immigrants

assimilate to US mainstream culture.¹⁹ In 2006, 10 prominent food companies initiated a self-regulatory proposal, called the Children's Food and Beverage Advertising Initiative (CFBAI), to establish nutrition standards for child-oriented advertising via TV, print, radio and Internet as well as the use of licensed characters.²⁰ The impact of the CFBAI on both child-oriented advertising and consumer purchasing and food consumption behaviors is still in its infancy. Moreover, most content analyses of TV advertisements have been limited to TV programming targeting white children.²¹ Content of child-oriented TV advertisements, in particular food advertisements viewed by low income Mexican American children, is limited.²²⁻²⁴

Low income Mexican Americans from the Texas-Mexico border experience numerous health disparities²⁵ and have alarming obesity rates, even among youth.²⁶ The prevalence of obesity ($\geq 95^{\text{th}}$ percentile using CDC standards for body mass index, BMI) among children in the US United States in general is disturbing. Nearly 17 percent 9% of US children aged 2-19 years are obese. The prevalence of obesity in underserved ethnic groups is even greater.²⁶ The prevalence of obesity in Mexican -American children, ages 2-19, is 20.8%; preschool children, 13.7 % 6-11 year olds, 24.7%, and 12-19 year olds, 22.2%.²⁷

Along the Texas-Mexico border, children from the Lower Rio Grande Valley (LRGV) of South Texas have the opportunity to view children's TV programming in both English and Spanish from television stations on both sides of the border. A few studies have examined TV viewing (content of TV advertisements aired in Baja California, Mexico: Spanish language only²⁴) and across the United States (television viewing amounts²² and content of TV advertisements aired after-school on US Spanish language networks only²³). To our knowledge, none of have examined the content of TV advertisements aired on both English and Spanish language broadcast networks along the Texas-Mexico border. Investigation of TV viewing by at-risk children on the Texas-Mexico border is warranted because TV time is increasingly associated with a sedentary lifestyle and a concomitant increased consumption of foods of poor nutritional quality.¹⁻⁶ In particular, describing the content of TV advertisements (current study) as well as the influence of these TV advertisements on children's health decisions and behaviors (future research) are needed. The aim of this content analysis study is to characterize the TV advertisements aired on English and Spanish language broadcast networks that may potentially be viewed by an at-risk Mexican American child population. In particular, the objectives of this study are to: 1) characterize the frequency, type of product (food vs. non-

food related), and target audience of the TV advertisements; 2) report the proportion of food-related advertisements from members and non-members of the Children's Food and Beverage Advertising Initiative (CFBAI); 3) describe the nutritional content of the foods advertised; and 4) identify persuasion/marketing tactics used to build brand recognition and entice young viewers to request specific food products.

Methods

Sample

Broadcast networks that aired child-oriented Saturday morning programming in the Lower Rio Grande Valley of South Texas were selected for analysis. A total of six broadcast networks (ABC, CBS, NBC, Univision, Telemundo, and TV Azteca) met this criterion and were grouped into three broadcast network categories: US English language (ABC, CBS, and NBC), US Spanish language (Univision and Telemundo), and Mexican Spanish language (TV Azteca). Other local or national broadcast networks were not included in the current study because: 1) these did not air child-oriented programming, or 2) were not available to non-cable viewing audiences (e.g., CW). For six weeks during the months of March, April, and May 2010, three trained, English/Spanish bilingual study observers (all native to the Texas-Mexico border) viewed TV advertisements aired on Saturday by all networks within the three broadcast network categories (US English language, US Spanish language, and Mexican Spanish language) for two 90 minute time-segments -- 7:00 a.m. to 10:30 a.m. (US Central time). This time frame (7:00-10:30 a.m.) was chosen because early Saturday morning programming is dedicated to young viewers by all of the networks. The child-oriented programming observed in this content analysis study typically targeted elementary and middle school children; hence, the investigators presume that children viewing the child-oriented Saturday morning programming were no older than 12-14 years old. The order of the broadcast network categories viewed was the following: 1) US English language, 2) US Spanish language, and 3) Mexican Spanish language. Broadcast networks within a broadcast network category (e.g., ABC, CBS, and NBC in the US English language) were randomly assigned to and viewed concurrently by one of the three study observers. Each broadcast network within a broadcast network category was viewed by one observer during the two viewing sessions. Because the three broadcast network categories varied by number of networks, observation time for each of the three categories varied: 540 minutes for the US English language category (3 networks, 180 minutes per network), 360 minutes for the US

Spanish language category (2 networks, 180 per network), and 180 minutes for the Mexican Spanish language category (1 network). The total observation time was 1,080 minutes (18 hours). All observations are stratified by broadcast network category (percentages reported represent categories within each broadcast network category).

Content Analysis

The number, type (food related vs. non-food related), and intended audience (children, adults, or both) of the TV advertisements were recorded. Classification for the type (food related vs. non-food related), and intended audience (children, adults, or both) was based on the predominant message and/or content of each commercial, and were coded to only one category. Food related products were classified as follows: cereals/breads, candy/sweets, dairy products, sugar-sweetened beverages, fast food/major restaurant chain, fruits/vegetables, meats/poultry/fish, and other (such as condiments) whereas non-food related items were classified as clothing, electronics, automobiles, toys, movie promotions, show/political/business promotions, hygiene, and other. The frequency of the TV advertisements by type (food related vs. non-food related) per 90 minutes for each broadcast network category were assessed. For food-related advertisements, the number of advertisements from members and non-members of the the Children's Food and Beverage Advertising Initiative by broadcast network category are reported. Intended audience or audience orientation was determined by the type of product advertised, actors portrayed in the advertisement, and persuasion tactics used. For example, child-oriented commercials were those that featured items used primarily by children, portrayed child actors, or used animation.

Nutrition Content of Foods Advertised

Nutrition content of advertised food products was obtained using the following sources: 1) food labels of the advertised food products; 2) food products' websites (Internet); and 3) the manufacturers were contacted for items without food labels or no nutrition content information on websites. Food labels were used for 10 food products (the US English language and the Mexican Spanish language broadcast network categories had five apiece), 24 websites were visited (six, four, and 14 foods advertised on the US English language, the US Spanish language, and the Mexican Spanish language broadcast network categories, respectively), and one call was made to the manufacturer for a food product advertised on the Mexican Spanish language broadcast network category.

Food products were categorized as meeting or not meeting current recommendations for a healthy diet (Table 1) based on the Institute of Medicine (IOM) recommended Nutrition Standards for Foods in Schools,²⁸ the 2010 Dietary Guidelines for Americans,²⁹ and the American Dietetic Association (ADA) position statement on dietary guidance for healthy children (acceptable macronutrient distribution ranges)³⁰ as well as empirical evidence on cholesterol³¹ and fiber⁷ from other investigators. The IOM standards for competitive foods offered at schools (e.g., à la carte and vending foods) were selected since the foods advertised on TV are analogous to competitive foods in the school setting.

Table 1. Nutrient Content Standards for Meeting Current Recommendations for a Healthy Diet

Nutrient Category	Standard
Calories per serving size	≤200
Total calories from fat	≤35%
Calories from saturated fats	≤10%
Calories from total sugars	≤35%
Sodium	≤200 mg
Carbohydrates	45-65% of total calories
Protein	5-10-30% of total calories
Cholesterol	<35 mg
Fiber	at least 1.5 g per serving

Standards adapted from the Institute of Medicine,²⁸ the 2010 Dietary Guidelines for Americans,²⁹ the American Dietetic Association,³⁰ Powell et al. (2007),⁷ and Kuribayashi et al. (2001).³¹

Persuasion/Marketing Tactics

The number and type of persuasion tactics employed to entice viewers were also recorded. Persuasion tactics were categorized as: narration, imagery only, product displayed throughout the advertisement, mascot/company character, and animation/special effects.

Advertisements with more than one persuasion tactic (except for imagery only) were coded as such.

Results

Frequency, Type, & Target Audience of TV Advertisements

A total of 481 commercials were aired (Table 2). One non-food related commercial was eliminated from the content analysis due to a coding error (description of the non-food related product is unknown). Of the 480 commercials, most were non-food related advertisements (n=397, 82.7%) while only 83 (17.3%) promoted foods. Although there were fewer food related commercials, most of these (n=79, 95.2%) were child-oriented: 59 (71.1%) targeted children only, 4 (4.8%) targeted adults, and 20 (24.1%) targeted both.

Table 2. Frequency, Type, & Target Audience of TV Advertisements (N=480)

Target Audience	Food Related (n=83)	Non-Food Related (n=397)	Total (N=480)
Children	59 (71.1%)	237 (59.7%)	296 (61.7%)
Adults	4 (4.8%)	132 (33.2%)	136 (28.3%)
Both	20 (24.1%)	28 (7.1%)	48 (10.0%)

Column percentages are shown.

Table 3 depicts the frequency of the TV advertisements by type (food related vs. non-food related) per 90 minutes. The US English language broadcast network category aired the most commercials per 90 minutes (n=245) followed by the US Spanish language broadcast network category (n=146) and the Mexican Spanish language broadcast network category (n=89). However, the Mexican Spanish language broadcast network category (40.4% of commercials) aired the highest percentage of food-related advertisements (Table 3). The US Spanish language broadcast network category (93.2%) aired the most non-food related commercials whereas the Mexican Spanish language broadcast network category (59.6%) aired the least (Table 3).

Table 3: Frequency of Advertisements per 90 Minutes by Broadcast Network Category (N=480)

Type of Advertisement	US English Language (n=245)	US Spanish Language (n=146)	Mexican Spanish Language (n=89)	Total (N=480)
Food related	37 (15.1%)	10 (6.8%)	36 (40.4%)	83 (17.3%)
Non-food related	208 (84.9%)	136 (93.2%)	53 (59.6%)	397 (82.7%)

Column percentages are shown.

The food categories most frequently advertised across all three broadcast network categories (Table 4), were, in rank order: fast food (20 commercials, 24.1%), cereals/breads (n=18, 21.7%), sugar-sweetened beverages (n=14, 16.9%), and candy/sweets (n=13, 15.6%). The US English language broadcast network category had the most commercials advertising sugar-sweetened beverages (n=7) and fast food/major restaurant chain (n=20). McDonald's Happy Meals (11 commercials) and the Chuck-e Cheese franchise (9 commercials) were the most frequently promoted restaurants. Sunny D (6 commercials), a fruit-flavored punch, represented the most advertised sugar-sweetened beverage product. In comparison to the other broadcast network categories, the Mexican Spanish language network category aired the most cereals/breads (n=15; 6 from the Bimbo Company) and candies/sweets commercials (n=7). Advertisements about fruit and vegetables (n=1) and dairy products (n=3) were rarely aired by any network.

Table 4: Foods Advertised per 90 Minutes by Broadcast Network Category (n=83)

Food Category	US English Language (n=37)	US Spanish Language (n=10)	Mexican Spanish Language (n=36)	Total (n=83)
Cereals/breads	3 (8.1%)	0 (0.0%)	15 (41.7%)	18 (21.7%)
Candy/sweets	6 (16.2%)	0 (0.0%)	7 (19.4%)	13 (15.7%)
Dairy products	0 (0.0%)	0 (0.0%)	3 (8.3%)	3 (3.6%)
Sugar sweetened beverages	7 (18.9%)	1 (10.0%)	6 (16.7%)	14 (16.9%)
Fast food/major restaurant chain	20 (54.1%)	8 (80.0%)	1 (2.8%)	29 (34.9%)
Fruits/vegetables	1 (2.7%)	0 (0.0%)	0 (0.0%)	1 (1.2%)
Meats/poultry/fish	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other	0 (0.0%)	1 (10.0%)	4 (11.1%)	5 (6.0%)

Column percentages are shown.

Table 5 demonstrates the the Children’s Food and Beverage Advertising Initiative membership affiliation for the food related advertisements by broadcast network category. The meats/poultry/fish food category was not included in Table 5 since none of the broadcast network categories aired any of these advertisements. Of note is that advertised foods considered to be of poor nutritional quality were primarily from food companies not affiliated with theAdvertising Initiative. For the US English language broadcast network category, all of the candy/sweets (n=6) advertisements were from non-members as well as the vast majority of advertisements for sugar-sweetened beverages (85.7%, 6 of 7 advertisements). Likewise all of the fast food/major restaurant chain advertisements (n=8) aired on the US Spanish language broadcast networks were from non-members. Most important, the vast majority of food-related advertisements aired on the Mexico Spanish language

broadcast network were from non-members (73.3% for cereals/breads, 85.7% for candy/sweets, and 83.3% for sugar sweetened beverages).

Table 5. Food Advertisements from Members and Non-Members of the Children’s Food and Beverage Advertising Initiative by Broadcast Network Category (n=83)

Food Advertisement Category	US English Language (n=37)		US Spanish Language (n=10)		Mexican Spanish Language (n=36)		Total (n=83)	
	Member n (%)	Non-Member n (%)	Member n (%)	Non-Member n (%)	Member n (%)	Non-Member n (%)	Member n (%)	Non-Member n (%)
Cereals/breads (n=18)	3 (100%)	N/A	N/A	N/A	4 (26.7%)	11 (73.3%)	7 (38.9%)	11 (61.1%)
Candy/sweets (n=13)	N/A	6 (100%)	N/A	N/A	1 (14.3%)	6 (85.7%)	1 (7.7%)	12 (92.3%)
Dairy products (n=3)	N/A	N/A	N/A	N/A	3 (100%)	N/A	3 (100%)	N/A
Sugar sweetened beverages (n=14)	1 (14.3%)	6 (85.7%)	1 (100%)	N/A	1 (16.7%)	5 (83.3%)	3 (21.4%)	11 (78.6%)
Fast food/major restaurant chain (n=29)	11 (55%)	9 (45%)	N/A	8 (100%)	1 (100%)	N/A	19 (65.5%)	10 (34.5%)
Fruits/vegetables ((n=1)	N/A	1 (100%)	N/A	N/A	N/A	N/A	N/A	1 (100%)
Other (n=5)	N/A	N/A	N/A	1	1 (25%)	3 (75%)	1 (20%)	4 (80%)

Row percentages for CFBAI membership are shown. N/A: not applicable.

The five most commonly aired non-food related advertisements (Table 6) across the three broadcast network categories were: show/political/business promotions (n=203, 51.1%), health-related messages (n=55, 13.9%), clothing (n=32, 8.1%), toys (n=28, 7.1%), and movie promotions (n=23, 5.8%). The US English language broadcast network category aired most of these advertisements (clothing, n=31; toys, n=28; and movie promotions, n=18). All three network broadcast categories aired show/political/business promotions; only the two US broadcast network categories (English and Spanish) aired health-related messages (n=55, 13.9%).

Of the 55 health-related messages, 26 (47.3%) were education-oriented, 16 (29.1%) were eco-friendly advocacy messages, eight (14.5%) were on parenting and community awareness, and five (9.1%) discussed healthy eating and active living (data not shown). Education-oriented messages promoted reading, tutorial programs, college preparation courses, and creativity workshops, which were primarily aired on the US English language broadcast network category (n=18). Eco-friendly advocacy (n=11) and parenting and community awareness messages (n=8) were mainly aired on the US Spanish language broadcast network category. Eco-friendly advocacy messages encouraged preservation of the world's natural resources while parenting and community awareness messages discussed family bonds and community safety and partnering. Only the US English language broadcast network category aired healthy eating and active living messages (obesity prevention).

Table 6: Non-Food Related Advertisements per 90 Minutes by Broadcast Network Category (n=397)

Non-Food Related Category	US English Language (n=208)	US Spanish Language (n=136)	Mexican Spanish Language (n=53)	Total (n=397)
Clothing	31 (14.9%)	1 (0.7%)	0 (0.0%)	32 (8.1%)
Electronics	4 (1.9%)	5 (3.7%)	0 (0.0%)	9 (2.3%)
Automobiles	0 (0.0%)	7 (5.1%)	0 (0.0%)	7 (1.8%)
Toys	28 (13.5%)	0 (0.0%)	0 (0.0%)	28 (7.1%)
Movie promotions	18 (8.7%)	1 (0.7%)	4 (7.5%)	23 (5.8%)
Show/political/business promotions	83 (39.9%)	83 (61.0%)	37 (69.8%)	203 (51.1%)
Hygiene	0 (0.0%)	11 (8.1%)	9 (17.0%)	20 (5.0%)
Other	16 (7.7%)	1 (0.7%)	3 (5.7%)	20 (5.0%)

Health-related messages	28 (13.5%)	27 (19.9%)	0 (0.0%)	55 (13.9%)
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Column percentages are shown.

Nutrition Content of Foods Advertised

The majority of the prepared foods (e.g., cereals, snacks, and drinks) advertised on both the US English and US Spanish language broadcast network categories (Table 7) did not meet the Institute of Medicine Nutrient Standard criteria for calories from saturated fat (54.1% and 90%, respectively), calories from carbohydrates (100% both), sodium (54.1% and 80%, respectively), and fiber (59.5% and 90%, respectively). For the 36 food-related advertisements aired on the Mexican Spanish broadcast network category, much of the nutrition content information of the advertised (prepared/packaged) foods was not available on food labels, food product websites, or from the manufacturers. Missing nutrition content information for these food products ranged from 25% to 64%. Furthermore, most of the prepared foods advertised on the Mexican Spanish language broadcast network category did not meet the criteria for calories from carbohydrates (50%) and calories from protein (66.7%).

Table 7. Food Advertisements that Met or Not Met Recommended Dietary Guidelines by Broadcast Network Category

Recommended Guideline	US English Language (n=37)		US Spanish Language (n=10)		Mexican Spanish Language (n=36)		
	Met n (%)	Not Met n (%)	Met n (%)	Not Met n (%)	Met n (%)	Not Met n (%)	N/A* n (%)
Total calories (kcal)	26 (70.3%)	11 (29.3%)	8 (80%)	2 (20%)	22 (61.1%)	5 (13.9%)	9 (25%)
Calories from total fat (%)	26 (70.3%)	11 (29.3%)	1 (10%)	9 (90%)	17 (47.2%)	10 (27.8%)	9 (25%)

Calories from saturated fat (%)	17 (45.9%)	20 (54.1%)	1 (1%)	9 (90%)	10 (27.8%)	3 (8.3%)	23 (63.9%)
Calories from carbohydrates (%)	0 (0%)	37 (100%)	0 (0%)	10 (100%)	9 (25%)	18 (50%)	9 (25%)
Calories from protein (%)	21 (56.8%)	16 (43.2%)	7 (70%)	3 (30%)	3 (8.3%)	24 (66.7%)	9 (25%)
Cholesterol (mg)	37(100%)	0 (0%)	9 (90%)	1 (10%)	15 (41.7%)	0 (0%)	21 (58.3%)
Sodium (mg)	17 (45.9%)	20 (54.1%)	2 (29%)	8 (80%)	19 (52.8%)	8 (22.2%)	9 (25%)
Fiber (g)	15 (40.5%)	22 (59.5%)	1 (10%)	9 (90%)	10 (27.8%)	3 (8.3%)	23 (63.9%)

N/A*: Nutritional information not available or reported on food label, food product website, or by the manufacturer.
 Row percentages for each recommended dietary guideline by broadcast network category are shown.

Persuasion/Marketing Tactics

Table 8 depicts the persuasion tactics employed in the TV advertisements aired across the three broadcast network categories. The three most commonly employed persuasion tactics were narration (n=58), animation/special effects (n=57), and product displayed throughout advertisement (n=53). These tactics were primarily used in advertisements aired on the Mexico Spanish language broadcast network category. The use of a mascot/character was more common among the US English language broadcast network category (n=11).

Table 8. Persuasion Tactics Employed in TV Advertisements by Broadcast Network Category

Tactic	US English Language (n=69)	US Spanish Language (n=19)	Mexican Spanish Language (n=100)	Grand Total (n=188)
Narration	17 (24.6%)	6 (31.6%)	35 (35.0%)	58 (30.9%)
Imagery only	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Product displayed	13 (18.8%)	5 (26.3%)	35 (35.0%)	53 (28.2%)
Mascot/character	11 (15.9%)	4 (21.1%)	5 (5.0%)	20 (10.6%)
Animation/special effects	28 (40.6%)	4 (21.1%)	25 (25.0%)	57 (30.3%)

Column percentages are shown.

Discussion

Contrary to what was found in previous studies, child-oriented TV advertisements from broadcast networks at the Texas-Mexico border consisted primarily of non-food related commercials (82.7%; 397 of 480) that encouraged the continuation of TV viewing, a sedentary behavior, via previews of upcoming TV shows. Nonetheless, similar to other TV commercial content analyses, early Saturday morning TV advertisements were child-oriented^{4,31} and the food related advertisements promoted unhealthy foods.^{5,31} Fast food, cereals/breads, sugar-sweetened beverages, and candy/sweets were the most frequently advertised foods across all networks, while the US English language broadcast network category aired the most fast food/major restaurant chain commercials and the Mexico Spanish language broadcast network category had the most

cereals/breads advertisements. Although the Government of Mexico, through the Ministry of Economy and the Ministry of Health, requires food labeling to include information on total calories, calories from fat, protein and carbohydrate content, sodium, and dietary fiber, these new regulations under the Norma Oficial Mexicana (NOM-051-SCFI/SSA1-2010) did not take effect until January 1, 2011.³² Observation of TV advertisements for the current study occurred in Spring 2010, and hence, the lack of food labeling regulations in Mexico at the time of data collection posed a problem for the nutrition content analyses. Prepared/packed foods advertised by the Mexican network lacked descriptive food labels and often failed to include all nutrient categories (e.g., calories, fats, carbohydrates, protein, cholesterol, sodium, etc.), making it impossible to differentiate foods as meeting or not meeting current dietary guidelines. To date, the investigators have been unable to obtain the nutrient content information from the food manufacturers. In comparison, nutrition content is required of all prepared/packaged foods in the US. Nonetheless, the influence of food labels on consumers' food selection behaviors is debatable.³³

While the impact of TV advertisements on childhood obesity was not evaluated, the influence of child-oriented food advertisements on dietary intake in children at risk for obesity (i.e., Mexican American youth) must be considered. Veerman et al.³⁴ used a predictive mathematical simulation model to calculate the impact of no food commercials on US childhood obesity rates. Based on BMI data from the 2003-2004 National Health and Nutrition Examination Survey (NHANES) Study, if children (aged 6-12 years) viewed zero food commercials, the average BMI would decrease by 0.38 kg/m² and obesity prevalence in boys and girls would decline by 2.7 and 2.4 percent-points, respectively.³⁴ Furthermore, Veerman et al.³⁴ hypothesized that at least 14% of obese children would not be obese if TV advertisements for unhealthy foods did not exist. Given that advertised foods across all broadcast networks were of poor nutritional quality and food labeling regulations vary along the Texas-Mexico border, policy action on both sides of the border to control marketing of high energy, low nutrient foods is justified.

As mentioned previously, the Children's Food and Beverage Advertising Initiative (CFBAI) is a self-regulatory proposal to establish nutrition standards for child-oriented advertising.²⁰ The current 17 members of the CFBAI pledge to only advertise "better-for-you" foods, limit licensed characters and other persuasive marketing techniques, not pay for product placement in any medium that is child-oriented, and restrict advertisements to children in elementary schools. However,

because this pledge is self-enforced and self-regulated by the 17 participating food companies, the pledge standards including what constitutes “better-for-you” foods vary between the food companies.²⁰ In 2009, the Center for Science in the Public Interest conducted an independent evaluation of the implementation and adherence of the CFBAI. Participating companies met their own self-imposed standards, yet 59% did not meet nutrition recommendations based on the 2005 Dietary Guidelines for Americans.²⁰ In the current study, advertised foods from both participating CFBAI and non-participating CFBAI food companies did not meet current dietary guidelines; range 8.3-100%. Because of the “better-for-you” pledge, several breakfast cereals were reformulated to contain more fiber and less fat and sugar, yet, these nutrition quality improvements have been negligible.³⁵ Breakfast cereal advertisements in this study were mainly aired from Mexico where food companies do not implement or are not encouraged to join the CFBAI. Hence, an international regulatory effort to monitor and enforce the reduction of child-oriented food advertising is needed. The International Obesity Task Force in 2008 produced a set of seven principles (the ‘Sydney Principles’) that call for statutory actions at the international level for the reduction of child-oriented marketing practices and the establishment of an International Code of Marketing Food and Beverages to Children.³⁶ However, the success of the ‘Sydney Principles’ is yet to be determined.’

The CFBAI also restricts the use of licensed characters and other persuasive marketing techniques. The use of licensed characters may lead to branding, identification and positive expectations related to a product in early childhood.^{37,38} TV advertisements aired across all three broadcast network categories used a variety of persuasion tactics to grab the attention of young viewers. As expected animation/special effects (30.3%) was a commonly employed persuasion tactic in all TV commercials while the use of a mascot/character (10.6%) was less used. However, mascots/characters were most often employed by food companies (i.e., Chuck E. Cheese) not participating in the CFBAI. Deterrence of brand loyalty for foods of poor nutritional quality in Mexican American children at risk for obesity may be achieved if more food companies from both sides of the border are required to restrict the use of persuasive marketing tactics. This may be pivotal in the control of unhealthy eating in Mexican American youth given that brand loyalty decreases with acculturation.¹⁹

The current content analysis study is the first to characterize TV advertisements targeting an at-risk child population on the Texas-Mexico

border. Findings may provide guidance in the formulation and, ultimately, evaluation of public health policy interventions that limit promotion of high energy, low nutrient foods. However, the present study is limited in that it is an observational study based solely on early Saturday morning programming during a three-month time period where day, time, and seasonal variation of TV commercials were not assessed. The results reported here may not be representative of what is aired on a daily, monthly, or annual basis. Additionally, observations came from a sample of six TV broadcast networks and advertisement programming may differ from other local or national broadcast networks and cable networks. These concerns, however, are mitigated by evidence from other studies showing that Saturday morning and evening commercials,³¹ top-rated TV shows,⁷ as well as after-school programming²² promote unhealthy foods. Kuribayashi et al.³¹ reported that morning commercials advertised more unhealthy food products containing sugar and cholesterol than evening commercials. Powell et al.⁷ found that 89.4-97.8% of food-related advertisements viewed by youth on top-rated TV shows on broadcast network, cable, and syndicated TV were of poor nutritional quality. Thompson et al.²² observed that 27-31% of food or beverage commercials aired after-school on Spanish language broadcast networks were of poor nutritional quality. Finally, inter-coder reliability cannot be reported since each broadcast network within any broadcast network category was viewed by only one study observer during the two viewing sessions. Nevertheless, further research is needed to create a more exhaustive and generalizable review of TV commercials and their impact on childhood obesity.

In summary, 17.3% (83 of 480) of early Saturday morning TV advertisements frequently viewed by Mexican American children at risk for obesity were food related and most of these targeted children (95.2%). Even though foods advertised across all three TV network broadcast categories were of poor nutritional quality, nutrition content information was unavailable or missing for most of the prepared/package foods advertised on the Mexican Spanish language broadcast network category, suggesting that food labeling and marketing regulations are less strict in Mexico. For US children at risk for obesity along the Texas-Mexico border, exposure to these TV food advertisements may result in an increased consumption of foods of poor nutritional quality. Food companies employing child-oriented advertisements from both sides of the border should be encouraged to join the CFBAI, even though adherence is modest,²⁰ and all countries should enforce the 'Sydney Principles' so that

comprehensive child-oriented marketing policies and nutrition standards may be established, monitored, and implemented.

Findings from the current study suggest that Saturday morning TV advertisements aired on English and Spanish language networks along the Texas-Mexico border promote the continuation of TV viewing, a sedentary behavior, as well as the consumption of foods of poor nutritional quality. A more in-depth analysis of TV advertisements viewed by Mexican American children and by other Hispanic subgroups is needed to understand the influence TV advertisements may have on children's screen-time and food selection behaviors. Future research should focus on the need to develop, implement, and, consequently, evaluate food marketing practices and nutrition policies targeting youth, in particular those targeting underserved at risk populations.

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