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# Adolescent Exposure to Food Advertising on Television

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**Background:** Television viewing is hypothesized to contribute to obesity among children and adolescents through several mechanisms that include the displacement of physical activity, snacking while watching TV, and the influence of food advertising.

**Methods:** This study drew on television ratings to examine the distribution of food advertising exposure among adolescents aged 12 through 17 based on 170 top-rated shows across network, cable and syndicated TV stations over the 9-month period from September 2003 to May 2004. A total of 238,353 30-second equivalent advertisements on the top-rated shows were assessed. Each advertisement was weighted by its rating to measure actual exposure to advertisements.

**Results:** The results showed that among total nonprogram content time, food-related products accounted for roughly one fifth of advertising exposure. Excluding TV promotions and public service announcements, as a proportion of all product advertising, total food-related advertising made up 26% of advertised products viewed by adolescents. By race, the proportion of advertising exposure to food products was 14% greater for African-American versus white adolescents and total exposure to food advertising would be even larger for African-American teens given that, on average, they watched more TV. Fast food was the most frequently viewed food product category comprising 23% of all food-related advertisements among adolescents.

**Conclusions:** Food ads made up just over one quarter of TV ads viewed by adolescents with the most commonly viewed products of fast food, sweets, and beverage products well within the reach of their own purchasing power.

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## Introduction

American adolescents are often overweight, fail to meet dietary recommendations, and watch several hours of television (TV) per day. Obesity rates (age- and gender-specific body mass index [BMI]  $\geq$ 95th percentile) among American adolescents aged 12 through 19 reached 17.4% in 2003–2004. By race, obesity rates were 21.8% among non-Hispanic African-American youths, 16.3% among Mexican Americans, and 17.3% among non-Hispanic white adolescents.<sup>1</sup> Further, a number of studies suggested that American youths consume too much dietary fat and sugar and that fruit and vegetable consumption and micronutrient intake is low compared with the United States Department of Agriculture (USDA) dietary recommendations.<sup>2–5</sup>

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Adolescents were estimated to watch on average just over 3 hours of television per day in 2004–2005.<sup>6,7</sup> The amount of TV viewing among adolescents was found to differ by race. Among a sample of children and teenagers aged 8–18 years, African-American youths were found to spend 48% more time watching TV daily compared to their white counterparts.<sup>6</sup> African-American teens aged 12–17 watched on average approximately 40% more TV during prime-time hours and approximately 95% more TV during the daytime (Monday–Friday, 10 AM–4:30 PM) compared to nonblack youths.<sup>8</sup> In addition, programming choices in African-American households also were distinct to those among non-African-American audiences.<sup>8</sup>

Poor dietary practices and related overweight among adolescents begs the question as to whether exposure to TV food advertising may be a contributing factor to these outcomes. This was the key focus of the recent Institute of Medicine<sup>9</sup> report that provided a comprehensive examination of food advertising to children and youth. The report concluded that there is strong evidence for children aged 2–11 that television advertising influenced short-term food consumption patterns and moderate evidence that it influenced usual

dietary intake, but there was insufficient corresponding evidence for teens aged 12–18. With respect to health, the report concluded that there was strong evidence for both children aged 2–11 and adolescents aged 12–18 that exposure to television advertising was significantly associated with adiposity.<sup>9</sup> However, assessing a causal relationship between exposure to food advertising and obesity is difficult. Television viewing is hypothesized to contribute to obesity among children and adolescents through several mechanisms that include the displacement of physical activity, snacking while watching TV, and the influence of food advertising. Thus it is difficult to quantify the effect of advertising on obesity because of its interrelatedness with sedentary activity and snacking while watching. TV viewing itself also may be endogenous to youth overweight and cross-sectional studies are unable to determine causality.<sup>10</sup> Several studies have linked television viewing with obesity among adolescents,<sup>11–14</sup> but have not disentangled the causal pathways.

No study to date has examined the content of advertising exposure specifically among adolescents, but several have done so for children. Assessing the extent of food advertising and the types of food products advertised on children's programming, a number of content analyses of advertisements have focused primarily on Saturday morning programming<sup>15–17</sup> with other analyses incorporating afternoon and primetime viewing hours<sup>18–20</sup> and one study to date has used ratings data for children aged 2–11.<sup>21</sup> These studies found that the proportion of food advertising ranged from 27% to 58% of total nonprogram content time and 36% to 71% of product advertising time.<sup>15–17,19,21</sup> The proportion of food advertising for cereal ranged from 28% to 49% and the proportion for candy and snacks ranged from 21% to 34%.<sup>15–19,21</sup> Estimates of the distribution of food advertising among children aged 6–11 years found 15% of ads to be for cereal and bread with estimates for candy/sweets and soft drinks at 44%.<sup>20</sup> A recent study focused its content analyses on differences in food advertisements aired on predominantly African-American versus general audience television stations during after-school programming and found statistically significantly more food and beverage commercials aired on Black Entertainment Television (BET) compared to Warner Brothers (WB) and the Disney Channel.<sup>22</sup> Other studies have also found a higher proportion of food advertising on African-American versus general audience primetime programming.<sup>23,24</sup>

This study drew on television ratings to examine the distribution of food advertising exposure among adolescents aged 12 through 17 based on 170 top-rated shows across network, cable and syndicated TV stations over the 9-month period from September 2003 to May 2004. A total of 238,353 30-second equivalent advertisements on the top-rated shows were assessed. To examine differences in exposure to food advertising by race,

we similarly assessed a total of 267,189 advertisements on the top-rated shows among white adolescents and a total of 253,885 advertisements on the top-rated shows among African-American teens aged 12–17. Using ratings data for each commercial, the distribution of exposure to nonprogram content time was classified across six mutually exclusive categories that include: (1) food products, (2) restaurants, (3) fast food, (4) other (non-food) products, (5) public service announcements (PSAs), and (6) TV promotions. The distribution of exposure to total food-related advertising was then examined across seven broad food categories and at a more disaggregated level highlighting the distribution rates for the top 25 food product categories.

## Methods

Television show ratings from Nielsen Media Research (NMR) for adolescents aged 12 through 17 years were used to select the following top-rated youth programming: (1) the 60 top-rated broadcast network series shows; (2) the 60 top-rated cable network series shows; (3) the 30 top-rated syndicated series shows; (4) the 10 top-rated broadcast network specials; and, (5) the 10 top-rated cable network specials. Based on this programming selection, we acquired monthly ratings from NMR on every advertisement that appeared during the 9-month period from September 2003 through May 2004. Standardized to a 30-second ad, these data amounted to a total of 238,353 advertisements aggregated over the 9-month period. The sample used in this study reflects the vast majority of the programming viewed by American adolescents. Cable and broadcast shows that fell below the 60-show cut-off used in this study consisted of shows viewed, on average, by less than 2.3% and 1%, respectively, of adolescents aged 12–17.

Thirty-eight percent of the sample of top-rated network series for adolescents aged 12–17 were from broadcast networks and 62% were from cable networks. Cable TV exposure was made up predominantly from MTV (40%), Nickelodeon (29%), Cartoon Network (TOON) (20%), and ABC Family (FAM) (7%), with Spike TV (SPK), Nick at Night (NAN), TBS Superstation (TBSC), TBS, and Country Music Television (CMT) making up the last 4%. The distribution of top-rated TV viewing across broadcast networks was composed as follows: FOX (34%), CBS (15%), WB (15%), ABC (14%), NBC (13%), and UPN (8%).

Samples by race, based on the same sampling procedure as for the full sample, contained 267,189 30-second equivalent advertisements on the top-rated shows among white adolescents aged 12–17 and a total 253,885 30-second equivalent advertisements on the top-rated shows among African-American adolescents aged 12–17. Among African-American adolescents, the distribution of cable network viewing was composed of BET (38%), TOON (37%), Nickelodeon (20%), MTV (3%), and SPK and TBS totaling 2%, while the distribution across broadcast network TV was composed of UPN (33%), WB (29%), FOX (22%), ABC (11%), NBC (3%), and CBS (2%). For white adolescents the distribution of viewing across cable TV was composed of MTV (37%), Nickelodeon (25%), FAM (17%), and TOON (13%), with SPK, NAN,

TBSC, TBS, and CMT making up the last 8%. The distribution of TV viewing for white adolescents across broadcast networks was comprised as follows: FOX (33%), ABC (18%), CBS (16%), WB (15%), NBC (14%), and UPN (4%).

Nielsen Media Research assigned each product advertisement a product classification code (PCC) that identified it with a product category. Each of the product categories had a corresponding aggregated major group PCC and industry group PCC along with a PCC description. The structure of product classification codes used by NMR is based on that used by the Publisher's Information Bureau.<sup>25</sup> In this sample, the food advertisements fell into a total of 103 product categories made up from a total of 616 distinct food product brands. The non-fast-food restaurant and fast-food restaurant product categories were single categories at both the product and group level. Several distinct product categories have common product groups. For example, the single product categories of candy, candy bar, and chewing gum all had a corresponding product group category of "candy and gum." The PCC codes, descriptions, and major group categories provided a clear characterization of items that were cereal, sweets, snacks, or beverages. The remaining products were classified as other.

Using the ratings data associated with each commercial, actual advertisement exposure was distinguished, rather than giving all advertisements equal weight based simply on the airing of the commercial. Ratings provided an estimate of the percentage of households with televisions watching a program or advertisement over a specified time interval. To assess the ratings of an advertisement among the U.S. adolescent audience, this study used targeted ratings points (TRPs), which estimate the reach and frequency of advertising to adolescents aged 12–17 years. For example, a commercial with 80 TRPs per month was estimated to have been seen an average of one time by 80% of adolescents aged 12–17 years over the 1-month period. The TRPs in these analyses weighted each advertisement by its rating to provide a measure of overall exposure. The monthly ratings on advertisements were aggregated over the 9-month period.

The distribution of exposure to nonprogram content time was classified across six mutually exclusive categories including: (1) food products, (2) non-fast-food restaurants, (3) fast-food restaurants, (4) other (nonfood) products, (5) PSAs, and

(6) TV promotions. We then examined the distribution of exposure to total food advertising (food products, non-fast-food restaurants and fast-food restaurants) by separate food product categories that included cereal, snacks, beverages, candy, fast-food restaurants, non-fast-food restaurants, and other food products. Finally, we examined advertising of food product categories at a more disaggregated level, highlighting the distribution rates for the top 25 food product categories. In our analyses by race, we tested whether the observed differences were statistically significant.

## Results

The distribution of nonprogram content time exposure among the mutually exclusive categories of food products, non-fast-food restaurants and fast-food restaurants, other product advertising, PSAs, and TV promotions for adolescents aged 12–17 along with separate exposure estimates for African-American and white adolescents are shown in Table 1. These data revealed that approximately one fifth (19.6%) of all national nonprogram content time exposure for adolescents aged 12–17 (20.4% for African-American and 18.7% for white adolescents) was food-related. Just over one fifth (21.9%) of total exposure among adolescents was to TV promotions; TV promotions made up roughly one quarter of nonprogram content time seen by African-American teens whereas they comprised just over one fifth of ads seen by white teens.

Excluding TV promotional advertising and PSAs, Table 1 shows that as a proportion of all product advertising, total food (food, restaurant, and fast-food) advertising made up 25.7% of product advertising (27.9% for African-American youths and 24.5% of product advertising among white adolescents). While the proportion of advertising exposure to food products was 3.4 percentage points (or 14%) greater for African-American versus white adolescents, total exposure to food advertising would have been even larger for

**Table 1.** Distribution of exposure to television nonprogram content time and advertising among adolescents aged 12–17 (%)

	All adolescents		African-American adolescents		White adolescents	
	Total nonprogram content time	Product ads	Total nonprogram content time	Product ads	Total nonprogram content time	Product ads
Food products	14.0	18.3	14.8*	20.2*	13.2	17.2
Non-fast-food restaurant	1.1	1.5	1.1	1.6**	1.2	1.5
Fast-food restaurant	4.6	6.0	4.4	5.9*	4.4	5.8
Food subtotal	19.6	25.7	20.4*	27.9*	18.7	24.5
Other products	56.9	74.3	52.8*	72.1*	57.9	75.5
Product subtotal	76.5	100	73.2	100	76.6	100
PSAs	1.6	Excluded	1.4	Excluded	1.7	Excluded
TV promos	21.9	Excluded	25.3*	Excluded	21.7	Excluded
Total	100	NA	100	NA	100	NA

\* and \*\* indicate that the distribution of exposure to the given item for the African-American is significantly different at  $p < 0.01$  and  $p < 0.05$ , respectively, from the distribution for the corresponding item in the respective column for white adolescents.

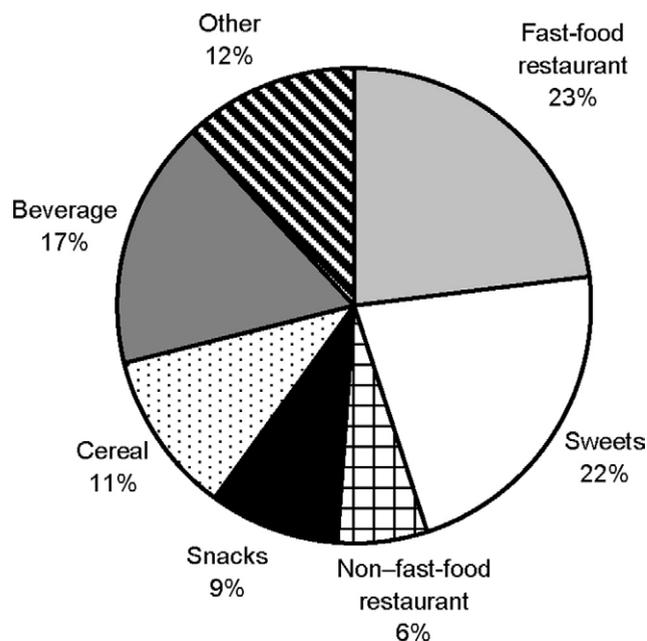
Subtotals may not add up due to rounding.

PSA, public service announcements.

African-American teens, given that, on average, they watched more TV.

Categorizing food advertising into seven broad food groups that included candy, cereal, beverages, snacks, fast-food restaurants, non-fast-food restaurants, and other foods, Figure 1 shows that fast-food was the most frequently viewed food product category, composing 23% of all food-related advertisements among adolescents. After fast food, advertisements for sweets and beverages made up 22% and 17%, respectively, of food ads. Next, cereal, snacks, and non-fast-food restaurant ads each made up 11%, 9%, and 6% of total food ads, respectively.

Table 2 reports exposure for the top 25 food product categories among total food advertising for adolescents



**Figure 1.** Distribution of advertising exposure by food. *Notes:* Candy includes: breath mints, candy, candy bar, chewing gum, cookie dough, cookies, cupcakes, frozen novelties, gelatin (mix and prepared), ice cream, ice cream novelties, pastry, pudding (mix and prepared) and snack cakes. Cereal includes: cereal and oatmeal. Beverages include: bottled water, cocoa mix, coffee, regular and diet soft drinks, dink mix, isotonic drinks, noncarbonated drinks, fruit drinks, fruit juices, iced coffee and tea, iced tea mix, milk, milk shake, and vegetable juice. Snacks include: crackers, nuts, popping corn, potato chips, rice cakes, snack bar, snacks, tortilla chips. Other includes: artificial sweetener, baby foods, bacon, baking chocolate, baking mix, baking soda, beans, beef, bread, buns, butter, cheese, cooking oil, cream cheese, dairy pds, dips, dough, eggs, entrees (frozen and prepared), food products, French fries, French toast-frozen, gravy, hot dogs, infant formula, luncheon meat, margarine, marinade, mayonnaise, mustard, non-dairy creamer, non-stick spray, pasta dinners, pasta sauce, peanut butter, pickles, pizza-frozen, pork, preserves, rice mix, salad dressings (bottled and mix), sauce (salsa, barbecue, hot, steak, Worcestershire), sausage, seafood, seasoning, soup-condensed, soup (ready to serve), sour cream, syrup, vegetables-canned, waffles-frozen, whipped topping, and yogurt.

**Table 2.** Distribution of exposure to top 25 food product categories among total food product advertising for adolescents aged 12–17, all teens and by race (%)

Food product category	All teens	African-American	
		teens	White teens
Fast-food restaurants	23.1	21.5	23.6
Cereals	11.5	14.6	10.2
Candy	7.2	8.2	7.0
Regular soft drinks	6.0	5.0	6.2
Candy bars	5.9	6.3	5.5
Non-fast-food restaurants	5.8	5.6	6.2
Chewing gums	4.8	4.3	5.0
Fruit drinks	3.3	3.1	3.7
Snacks	3.3	4.2	2.9
Drinks—isotonic	3.0	1.9	3.0
Yogurt	2.4	2.8	2.3
Potato chips	1.7	1.4	1.8
Milk	1.7	1.2	1.8
Cookies	1.7	2.1	1.5
Waffles—frozen	1.4	2.0	1.2
Tortilla chips	1.3	0.8	1.4
Entrees—frozen	1.3	1.2	1.4
Snack bar	1.2	1.4	1.2
Crackers	0.9	1.1	0.8
Entrees—prepared	0.9	1.0	0.8
Fruit juices	0.8	0.3	1.1
Pastry	0.8	1.0	0.7
Soup—condensed	0.7	0.9	0.6
Drink mix	0.5	1.0	0.5
Pasta dinners	0.5	0.6	0.4

*Note:* The differences in the distribution of exposure for African-American and white adolescents for each of the 25 top food product categories are statistically significant at  $p < 0.01$ .

aged 12–17 with separate estimates by race for African-American and white teens. As shown in Figure 1, fast-food restaurants ranked the highest, comprising 23.1% of total ads. This held for both racial groups, with fast-food ads comprising 21.5% and 23.6% of total food advertising exposure for African-American and white adolescents, respectively. At a disaggregated level, cereal was the next most frequently viewed single food product category, making up 11.5% of food ads (14.6% of food ad exposure among African-American teens and 10.2% among white teens).

Examining candy and sweets at the disaggregated level, candy made up 7.2% of food ads, followed by candy bars (5.9%), chewing gum (4.8%), cookies (1.7%), and pastry (0.8%). Each of these candy and sweets categories (with the exception of chewing gum) made up a greater proportion of food ads among African-American versus white teens. In terms of beverages, regular soft drinks comprised 6.0% of food ads (5.0% and 6.2% of ads seen by black and white adolescents, respectively), while milk accounted for only 1.7% (1.2% for African-American and 1.8% for white teens) of all food ads seen by adolescents.

Given that fast food restaurant ads were the most frequently viewed food-related product category, the

**Table 3.** Distribution of fast-food restaurant advertising by company name seen by adolescents aged 12–17, all teens and by race (%)

Parent company	All teens	African-American teens	White teens
Burger King	22.3	24.0	20.8
McDonald's	22.0	28.5	20.3
Taco Bell	11.0	4.1	10.7
Subway	10.8	6.9	12.0
Wendy's	8.7	8.2	8.8
KFC	8.0	11.0	8.5
Pizza Hut	5.9	8.5	6.7
Dominos	3.5	3.7	4.1
Sonic	3.0	1.5	2.8
Papa John's	1.4	1.4	1.8
Arbys	1.1	0.6	0.9
Quizno's	1.0	1.3	1.3
Dairy Queen	1.0	0.4	1.0
Long John Silver's	0.2	0.0	0.2
Total	100.0	100.0	100.0

*Note:* The differences in the distribution of exposure for African-American and white adolescents for each of the fast food companies (with the exception of Quizno's) were statistically significant at  $p < 0.01$ . Ads for Boston Market also occurred in our sample but they made up less than 0.01% of fast food advertising in the full sample and by race and hence were not included in the table.

study examined the distribution of products within this category. Table 3 lists the distribution of fast-food restaurant advertising by restaurant parent company name seen by adolescents aged 12–17. The table shows that in national advertising, Burger King and McDonald's advertisements each accounted for roughly 22% of all fast-food ads seen by U.S. adolescents. Next, Taco Bell and Subway each accounted for another 11% of fast-food ads. Wendy's, KFC, and Pizza Hut made up 9%, 8%, and 6% of total fast-food ads, respectively, while the remaining fast-food restaurants each accounted for less than 4%. By race, for African-American teens, ads from the most frequently viewed fast-food restaurants (McDonald's and Burger King) combined made up 52.5% of all fast-food ads, compared to 41.1% of such ads seen by white teens. Among white teens, Subway made up 12.0% of all fast-food ads seen, whereas these ads comprised only 6.9% of ads viewed by African-American teens. KFC ads were more prevalent among African-American viewers, making up 11.0% of fast-food ads.

## Discussion

This study presented the first content analyses of television advertising viewed by American adolescents. Based on television ratings for adolescents aged 12 through 17, the results showed that among total non-program content time, food-related products accounted for roughly one fifth of advertising exposure, while TV promotions made up just over another one fifth of all ads. Excluding TV promotions and PSAs, as a proportion of

all product advertising, total food-related advertising made up 25.7% of advertised products viewed by adolescents. Fourteen percent more food-related advertising was viewed by African-American teens (27.9%) than by white teens (24.5%).

Fast-food restaurant advertisements were found to make up 23.1% of all food ads seen by adolescents (21.5% and 23.6% for African-American and white teens, respectively), and McDonald's and Burger King advertisements made up approximately 44% of fast-food ads seen by teens. Sweets and beverage ads accounted for 22% and 17% of all food ads, respectively, while cereal ads made up 11%. The finding of the top category of fast-food ads in the distribution of food products viewed by teens differed from findings in earlier studies for younger children's programming which consistently reported cereal as the top food product advertised to children.<sup>15–19,21</sup>

A key limitation to the results presented in this study was that the data did not include spot (non-national local-area) advertising. If the distribution of products in spot advertising was substantially different from the distribution of national advertising then this sample selection would bias our results. However, the majority of spot advertising is for products not relevant to the teen market (e.g., automotive, telecommunications, furniture stores, insurance and real estate, financial).<sup>26</sup> Despite this limitation, this was the first study to examine the content of TV advertising based on a programming sample that was representative of the shows viewed by adolescents aged 12–17 and, in addition, reported weighted findings based on television ratings.

Children and adolescents represent an important market for advertisers.<sup>27,28</sup> Food advertising has been associated with increased product-specific purchase requests among young children,<sup>29–32</sup> and such children are estimated to directly influence \$330 billion of parental spending.<sup>33</sup> Among older children, it is estimated that approximately three quarters of youths aged 8–17 influence family food purchases.<sup>9</sup> In addition, adolescents represent an important consumer market as they are much more likely than younger children to be direct consumers, given that they spend a significant amount of their own money. U.S. adolescents aged 12–19 were estimated to have spent \$159 billion in 2005.<sup>34</sup> Indeed, fast food, sweets, and beverage products shown in this paper to make up the majority of food advertising seen by adolescents are items that are well within the reach of their own purchasing power. In order to provide policymakers with sufficient evidence to assess the extent to which food advertising impacts adolescents' dietary patterns and weight outcomes, further research is needed to examine differences in exposure to television advertising content by holding TV viewing time constant and controlling for sociodemographic and other contextual factors.

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