

Television food advertising viewed by preschoolers, children and adolescents: contributors to differences in exposure for black and white youth in the United States

F. Fleming-Milici and J. L. Harris

Rudd Center for Food Policy and Obesity,
University of Connecticut, Hartford, CT, USA

Address for correspondence: F
Fleming-Milici, Rudd Center for Food
Policy and Obesity, University of
Connecticut, One Constitution Plaza,
Suite 600, Hartford, CT 06103, USA.
E-mail: frances.flemingmilici@uconn.
edu

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Summary

Background: Public health experts raise concerns about adolescents' and black youth's greater exposure to TV advertising for unhealthy foods and beverages compared with children and white youth.

Objectives: Examine how television-viewing patterns and rates of advertising during targeted programming contribute to this greater exposure.

Methods: Nielsen panel data provided viewing times and amount of food advertising viewed on U.S. television in 2008 and 2012. Researchers compared results by network type (black-, child- and youth-targeted), age group (preschoolers, children and adolescents) and race (black and white youth).

Results: Food advertising exposure increased with age for both black and white youth, but black youth viewed approximately 50% or more ads than did white youth of the same age. Higher rates of food advertising on youth-targeted networks explained greater adolescent exposure. However, greater television viewing and higher rates of advertising on youth- and black-targeted networks both contributed to black youth's greater exposure. From 2008 to 2012, increases in food-ads-per-hour increased exposure for all youth.

Conclusions: Food advertisers and networks, especially those targeting adolescents and black youth, must do more to reduce advertising that negatively impacts young people's health. Furthermore, reducing commercial-television viewing by black youth may help reduce health disparities affecting their communities.

Keywords: Food advertising, TV viewing, adolescents, children, health disparities.

Introduction

Marketing of energy-dense nutrient-poor foods and beverages contributes to poor diet and obesity among all youth (ages 2–17).(1,2) In recent years, major food companies have pledged to reduce unhealthy food advertising to children,(3) yet public health experts also raise concerns about food advertising aimed at adolescents.(4) In the United States food companies spend over \$1 billion annually in marketing directed to adolescents, with fast food and sugary drinks representing approximately two-thirds of these expenditures.(5) Furthermore, food company pledges apply to TV programming directed at children under age 12, but do not limit unhealthy food advertising during programming with a high percentage of youth age 12 and older.(6) As a result, TV food advertising to children under 12 has improved somewhat in

recent years, while unhealthy food advertising directed to adolescents age 12 and older has increased.(7)

Unhealthy food marketing to youth is a worldwide issue.(8) In the U.S. disproportionate exposure to food marketing by black youth compared to white youth raises additional public health concerns(9) as it likely contributes to health disparities affecting black communities, including higher rates of obesity and other diet-related diseases.(10) Black youth encounter more unhealthy food and beverage marketing in their communities.(11) They also tend to consume more media in all forms, including TV,(12,13) which further contributes to greater food advertising exposure.(13) Yet greater TV viewing time may not fully explain disparities in TV ad exposure.(13–15) Adjusting for higher rates of viewing, black youth view relatively more TV ads for some types of foods and

beverages, including energy drinks and regular soda, (14) fast food(15) and candy,(13) compared to white youth. Content analyses have confirmed that programming with high rates of black viewership contain more food advertising overall (9) and more unhealthy food advertising (9) than general-audience programming. Notably, black youth also consume more fast food and sugary drinks compared with white youth. (16,17)

Understanding the relative contribution of factors leading to greater TV food advertising exposure for adolescents and black youth is necessary to identify effective solutions to counter its harmful effects. Yet research has not examined how much of this greater exposure is due to differences in time spent watching TV vs. differences in advertising during TV programming that adolescents and black youth are more likely to watch. The present study begins to address this question by: (i) measuring TV viewing times and TV food and beverage ads viewed by black and white preschoolers, children and adolescents, including changes from 2008 to 2012; (ii) comparing TV viewing and exposure by network type (black-targeted, child-targeted and youth-targeted); and (iii) documenting the amount and categories of food and beverage ads viewed on targeted networks.

Methods

Researchers licensed Nielsen gross ratings point (GRP) data to quantify exposure to TV food and beverage advertising by black and white youth from January 1 to December 31, 2008 and 2012.(18) GRPs provide a per capita measure of advertisements viewed by individuals in a specific demographic group (e.g. age range, race) over a specific period of time. GRPs are the standard measure used by the advertising industry to evaluate the reach and frequency of TV advertising campaigns, and they have been used in previous research on youth exposure to TV food and beverage advertisements.(13–15,19,20) GRPs are calculated by Nielsen as the sum of all advertising exposures for all individuals within a demographic group, divided by population size, and multiplied by 100. Therefore, GRPs divided by 100 provide the number of ads viewed on average by all individuals within the demographic group.

GRPs for all food, beverage and restaurant advertisements (Nielsen category codes 1–15) that aired on U.S. English-language network, cable and syndicated TV were obtained for white and black youth in three age groups: preschoolers (2–5 years), children (6–11 years) and adolescents (12–17 years). Nielsen

does not provide GRP data on advertising in spot (i.e. local) TV for black and white sample breaks. However, in 2012, spot TV programming accounted for just 5% of food and beverage GRPs for 2- to 17-year-olds.(21) Nielsen classifies individuals' race according to self-identified race of the designated head-of-household.

Researchers assigned Nielsen-defined products to the food categories most often marketed to children and adolescents,(22) with additional categories for diet and regular carbonated beverages, energy and sports drinks, and fruits and vegetables. Products that could not be classified as a specific food category (e.g. company-level ads) and those not included in one of the designated categories (e.g. condiments, baking products) were classified as 'all other.'

Researchers determined weekly TV-viewing times and audience share by network using Nielsen MarketBreaks data.(23) Nielsen provides average estimated numbers of persons viewing during a specified period of time, by race and age group, for the majority of TV networks. Average percentage of total viewing audience consisting of children (2–11 years), adolescents (12–17 years) and black individuals (2–99 years) in 2010 was calculated for each network. Three types of networks were identified for analysis: (i) *Child-targeted networks*, in which children under age 12 represented 35% or more of the total audience. Most companies participating in the Children's Food and Beverage Advertising Initiative (CFBAI) food industry self-regulatory program use this definition of 'child-directed media.'⁽³⁾ (ii) *Youth-targeted networks*, with an audience composed of 21% or more 2- to 17-year-olds, but excluding networks that qualified as child-targeted. FTC used this definition in its analysis of advertising expenditures to youth.(5) On average, 2- to 17-year-olds comprised 14% of the total TV viewing audience.(23) Thus, these networks attract a disproportionately high proportion of children and adolescents. (iii) *Black-targeted networks*, where black individuals represented more than one-half of the total viewing audience. Of note, black viewers comprised just 17% of the total TV-viewing audience for all networks.(23)

Researchers then calculated the average number of ads viewed by black and white preschoolers, children and adolescents by food category in total and by network type. Nielsen MarketBreaks also provided the average percentage of persons in each demographic group viewing each minute of programming on each network in total, which was used to calculate average daily viewing time for each network and demographic group. Significant differences in the proportion of advertising exposure for different food and beverage

categories and network types for black vs. white youth were calculated using two-proportion z tests.

Results

In 2012, both black and white adolescents viewed 27% to 42% more food ads than did preschoolers and children of the same race (Table 1). This difference was because of higher rates of ads-viewed-per-hour for adolescents, as there were few differences in amount of TV viewing between age groups. Furthermore, from 2008 to 2012, total food ads viewed increased for all youth, driven primarily by an increase in the number of food-ads-per-hour of TV viewing, especially for adolescents.

In 2012, black youth also viewed considerably more food ads compared with white youth of the same age: black preschoolers and adolescents saw 64% more ads, and black children saw 49% more ads. Notably, black preschoolers saw approximately two more food ads daily than did white adolescents. In addition, disparities in food ads viewed by black vs. white youth increased during this time. Black adolescents viewed 30% more ads in 2012 than in 2008, while ads viewed by white adolescents increased by 18%. Similarly, black preschoolers' ad exposure increased 16%, compared with a 4% increase for white preschoolers. Differential changes in amount of TV viewing contributed to this increased disparity. Whereas TV-viewing time declined for white youth of all ages, black preschoolers and adolescents watched somewhat more TV in 2012 than in 2008. A greater increase in

ads-viewed-per-hour for black preschoolers than for white preschoolers further contributed to disparities in this age group. In contrast, both black and white children watched 3% less TV in 2012, and the increase in food ads viewed by black children was comparable to the increase for white children (5% and 2%, respectively).

Advertising exposure by network type

In 2012, child-targeted networks contributed one-third of food ads viewed by black preschoolers and children, and a significantly higher proportion (38–39%) of ads viewed by white preschoolers and children (Table 2). Youth-targeted networks contributed the most food ads viewed by black and white adolescents (approximately one-quarter of the total). Youth-targeted networks also were responsible for 12 to 13% of food ads viewed by white and black preschoolers, while these networks contributed a significantly higher proportion of foods ads viewed by black children (19%) than by white children (16%). Black-targeted networks contributed 10% of food ads viewed by black preschoolers and children and 14% of ads viewed by black adolescents, but not surprisingly just 1% of ads viewed by white youth.

The frequency of food and beverage ads-viewed-per-hour varied greatly by network type. Black- and youth-targeted networks averaged approximately nine or more food-ads-per-hour, compared with 3.6 or fewer for child-targeted networks. All other networks averaged approximately six food-ads-per-

Table 1 Changes in food and beverage advertising exposure for black and white youth from 2008 to 2012¹

	Preschoolers (2 to 5 years)			Children (6 to 11 years)			Adolescents (12 to 17 years)		
	Black	White	Ratio of black:white ³	Black	White	Ratio of black:white	Black	White	Ratio of black:white
<u>Total ads-viewed-per-day²</u>									
2008	14.5	9.9	1.46	16.5	11.5	1.43	18.6	12.6	1.48
2012	16.9	10.3	1.64	17.4	11.7	1.49	24.2	14.8	1.64
Change 2008 to 2012	16%	4%	12%	5%	2%	4%	30%	18%	11%
<u>Ads-viewed-per-hour</u>									
2008	4.0	4.1	0.98	4.3	4.6	0.93	4.8	5.0	0.96
2012	4.5	4.3	1.05	4.7	4.9	0.96	6.2	6.5	0.95
Change 2008 to 2012	12%	5%	7%	8%	5%	3%	28%	30%	-1%
<u>Daily viewing times (h:min)</u>									
2008	3:38	2:26	1.49	3:49	2:30	1.53	3:52	2:33	1.52
2012	3:48	2:24	1.58	3:44	2:24	1.56	3:56	2:18	1.71
Change 2008 to 2012	4%	-2%	6%	-3%	-3%	2%	2%	-10%	13%

¹Nielsen MarketBreaks Program Report, Nielsen Ad Intel 2008–2012.

²Includes national broadcast, cable and syndicated programming.

³A comparison of black and white youth for each measure in each year; a ratio >1.0 indicates a higher number for black youth.

Table 2 Advertising exposure for black and white youth by network type in 2012¹

	Black youth			White youth		
	Ads viewed (% of total ads viewed)	Daily h:min viewed (% of total h:min viewed)	Ads viewed per hour	Ads viewed (% of total ads viewed)	Daily h:min viewed (% of total h:min viewed)	Ads viewed per hour
<u>Preschoolers (2 to 5 years)</u>						
Child-targeted networks	1970 (32)	2:07 (56)	2.6	1442 (39) ²	1:29 (62)	2.7
Youth-targeted networks	815 (13)	0:14 (6)	9.3	466 (12)	0:07 (5)	9.7
Black-targeted networks	644 (10) ²	0:12 (5)	8.8	28 (1)	0:00	0.0
All other networks	2730 (44)	1:14 (33)	6.0	1802 (48) ²	0:46 (32)	6.3
All networks	6159	3:47	4.4	3738	2:24	4.3
<u>Children (6 to 11 years)</u>						
Child-targeted networks	1988 (32)	2:05 (56)	2.6	1602 (38) ²	1:20 (56)	3.3
Youth-targeted networks	1183 (19) ²	0:21 (10)	9.0	698 (16)	0:12 (9)	9.0
Black-targeted networks	613 (10) ²	0:11 (5)	8.7	2 (1)	0:00	0.0
All other networks	2512 (40)	1:05 (29)	6.3	1916 (45) ²	0:49 (35)	6.3
All networks	6296	3:42	4.6	4243	2:21	4.8
<u>Adolescents (12 to 17 years)</u>						
Child-targeted networks	1153 (13)	1:03 (27)	3.0	718 (13)	0:33 (24)	3.6
Youth-targeted networks	2328 (27)	0:42 (18)	9.1	1492 (28)	0:25 (19)	9.6
Black-targeted networks	1218 (14) ²	0:22 (10)	8.8	69 (1)	0:01 (1)	9.0
All other networks	4058 (46)	1:48 (46)	6.2	3099 (58) ²	1:17 (56)	6.6
All networks	8757	3:55	6.1	5378	2:16	6.4

¹Analysis of Nielsen data from January 1 to December 31, 2012.

²Exposure to ads for network type significantly greater at $p < .05$.

hour. As a result, hours spent watching different types of programming substantially impacted food ads viewed by both black and white youth. For example, black preschoolers spent over 2 h watching child-targeted programming daily (56% of their TV viewing), but child-targeted programming contributed just 32% of the food and beverage ads they viewed. In contrast, black preschoolers spent just 14 min-per-day watching youth-targeted programming (6% of TV-viewing time), but those programs were responsible for 13% of the food ads they viewed.

Even within network type, food-ads-per-hour varied greatly between networks (Table 3). Black-targeted networks with the highest rates of food and beverage advertising included VH1 (10 ads-per-hour) and Black Entertainment Television (eight ads-per-hour). Among youth-targeted networks, Fuse and Nick-at-Nite each contained more than 15 food-ads-per-hour. Nickelodeon had the highest rate of food advertising for child-targeted networks at eight ads-per-hour, while other child-targeted commercial channels had among the lowest rates, including Disney XD, NickToons and TeenNick at less than five food-ads-per-hour. Of note, black youth spent more time watching one child-targeted network with no food advertising (The Disney Channel) than any other single

network. Among all other networks, FX, TBS and Comedy Central featured nine food-ads-per-hour or more of viewing by black adolescents.

Food and beverage categories advertised

Four product categories contributed almost 60% of food ads viewed by all youth in 2012: breakfast cereals, candy, fast-food and other restaurants (Supporting Information, Table S1). Nearly one-quarter of these ads promoted fast-food restaurants, with white youth viewing two to four fast food ads-per-day and black youth viewing four to six ads-per-day. Although black youth viewed more ads than white youth viewed in every food and beverage category, the proportion of food ads viewed differed significantly for only two categories: candy represented a significantly higher proportion of ads viewed by black children as compared to white children, while breakfast cereals represented a significantly lower proportion.

Examining ads viewed by black children (2–11 years) and adolescents (12–17 years) in 2012 for specific food categories also highlighted differences in food categories advertised by network type

Table 3 TV networks viewed most by black youth in 2012

Network	Black children (2 to 11 years)		Black adolescents (12 to 17 years)	
	Daily viewing (h:min)	Ads viewed per hour	Daily viewing (h:min)	Ads viewed per hour
<u>Black-targeted networks</u>				
VH1	0:02	10.5	0:06	10.3
TV One	0:01	8.2	0:01	7.8
BET	0:07	7.9	0:14	8.0
Total black-targeted	0:11	8.6	0:23	8.6
<u>Youth-targeted networks</u>				
Fuse	0:00	16.9	0:00	16.9
Nick-at-Nite	0:03	15.3	0:06	16.4
MTV2	0:00	11.8	0:03	11.9
ABC Family	0:03	10.0	0:04	10.0
MTV	0:01	8.1	0:07	8.1
Adult Swim	0:05	7.0	0:14	6.7
TeenNick	0:03	3.5	0:04	4.6
Total youth-targeted	0:18	9.1	0:42	9.2
<u>Child-targeted networks</u>				
Nickelodeon	0:23	7.8	0:12	8.2
The Cartoon Network	0:15	5.1	0:12	5.0
Nicktoons	0:06	4.5	0:03	4.2
Disney XD	0:08	2.3	0:05	2.3
Disney ¹	0:51	0.0	0:27	0.0
Nick Jr. ¹	0:19	0.0	0:01	0.0
Total child-targeted	2:05	2.5	1:03	3.1
<u>Other top networks²</u>				
FX	0:02	9.9	0:03	10.0
TBS Network	0:02	9.9	0:05	9.7
USA Network	0:03	7.6	0:05	7.2
ABC	0:02	6.5		
CBS	0:03	6.2		
Comedy Central			0:02	9.2
Turner Network Television			0:04	6.4
Total all other	1:09	6.1	1:48	6.1

¹Network did not accept commercial advertising in 2012.

²Includes networks with >100 ads viewed by children ages 2 to 11 and >150 ads viewed by adolescents ages 12 to 17.

(Supporting Information, Table S2). Compared with other networks, black-targeted networks contributed a significantly higher proportion of ads for candy, fast-food and other restaurants, baked goods and regular carbonated beverages viewed by black youth; and a significantly lower proportion of ads for breakfast cereals, prepared foods and dairy products. Black children also viewed a significantly lower proportion of ads for fruits and vegetables and prepared foods and meals on black-targeted networks. Similarly, youth-targeted networks contributed a significantly greater proportion of ads for fast food, candy, baked goods and regular carbonated beverages viewed by black youth compared with other networks, as well

as a significantly greater proportion of energy drink ads. In contrast, child-targeted networks were responsible for a significantly higher proportion of ads viewed by black youth for breakfast cereals and dairy products.

Discussion

To our knowledge, this study presents the first comprehensive examination of TV-viewing patterns by age group for black and white youth and how amount and types of TV viewing contribute to differential exposure to food and beverage advertising. Black youth's greater exposure to TV food advertising can

be attributed partly to greater time spent watching TV, but differences in rates of food advertising and categories of foods advertised during child-, youth- and black-targeted TV programming further contribute to differential exposure by race. In contrast, greater exposure for adolescents is due primarily to higher rates of food advertising during programming viewed relatively more by adolescents than by preschoolers and children. For all youth, two-thirds of food ads viewed promoted fast-food and other restaurants, breakfast cereals, candy and snack foods. Previous research has shown that the vast majority of advertising for these categories promotes products that are high in sugar, saturated fat and/or sodium.(14,15,24) Furthermore, many of the persuasive techniques used in advertising for unhealthy foods disproportionately appeal to youth.(25)

Notable increases in the number of food ads appearing per hour of TV viewed contributed to increases in TV food and beverage ads viewed by both black and white youth from 2008 to 2012. Further research is required to understand the cause. Possible explanations include increases in the proportion of food ads relative to non-food ads or 15-s vs. 30-s ads(26) and/or shortened programming time to allow more advertising.(27) As companies continue to increase the efficiency of their advertising budgets, additional steps will be necessary to further protect youth from the impact of resulting increases in unhealthy food advertising exposure.

On average, TV viewing by black and white youth of all ages exceeded the maximum 2 h-per-day of total screen time recommended by the American Academy of Pediatrics (AAP).(28) Thus, reducing TV viewing for all youth would reduce exposure to unhealthy food advertising and benefit their health in other ways. However, black preschoolers and children watched approximately 1 h and 20 min more TV daily compared with white preschoolers and children; and black adolescents watched 1 h and 38 min more than white adolescents watched. As a result, black preschoolers, children and adolescents viewed 2000 to 3400 additional food-ads-per-year compared with their white counterparts. Understanding the reasons for their greater TV viewing and identifying opportunities to reduce viewing would help address health disparities affecting black youth. Future research should also examine how household viewing habits contribute to TV viewing differences among youth. For example, black children as compared to white children are more likely to share a bedroom with an older sibling or adult family member(12) and to live below the poverty level, which predicts overcrowded living conditions.(29) These factors may pose great barriers

to reducing TV viewing and enforcing limits on screen time and types of programs viewed.

Nonetheless, these findings also indicate that higher rates of unhealthy food advertising during youth- and black-targeted TV programming greatly contribute to disproportionate exposure by black youth. Black preschoolers, children and adolescents viewed considerable numbers of food advertisements on black-targeted networks, which had among the highest rates of food advertising. Black-targeted networks also contributed a significantly higher proportion of ads for some primarily unhealthy categories,(13–15) including fast-food and other restaurants, candy and carbonated beverages, as well as a lower proportion of dairy and fruit and vegetable ads. When compared with their white peers, black preschoolers and children also spent relatively less time watching child-targeted TV networks, which averaged much lower rates of food advertising per hour (including non-commercial channels) and included significantly fewer or no ads for many of the least healthy categories. Of note, food advertising on child-targeted networks is generally covered by CFBAI self-regulatory pledges, while advertising on other networks is not.(3) Black preschoolers and children also spent twice as much time watching youth-targeted networks compared with white children. These networks also contributed a high 9.0 to 9.3 food ads for every hour viewed, as well as a higher proportion of ads for fast-food and other restaurants, candy, carbonated beverages and energy drinks. Furthermore, these differences in rates of food advertising by network type fully explain higher exposure by black and white adolescents compared to children of the same race, as adolescents did not spend more time watching TV.

These results also reveal a continued widening of the disparity between black and white youth exposure to food advertising, previously documented for the 2003 to 2007 period.(30) A decline in TV viewing from 2008 to 2012 by white youth of all ages during this period partially offset increased rates of food advertising exposure. However, TV viewing by black preschoolers and adolescents (but not children aged 6 to 11) increased slightly from 2008 to 2012, resulting in greater differences in food advertising exposure for black relative to white youth in these age groups. In addition, black preschoolers' ad exposure increased by 16% with just a 4% increase in daily viewing time, indicating that their viewing of programming with relatively higher rates of food advertising per hour also increased. A closer examination of why TV viewing declined for white youth, but not for most black youth, could also highlight opportunities to

develop interventions to reduce black youth's exposure to unhealthy food advertising.

In summary, this research identifies substantial opportunities for improvements in food advertising to all youth that would help address disproportionate exposure by black youth and provide additional protection for adolescents. In particular, frequent advertising for unhealthy foods and beverages on both black- and youth-targeted TV networks support public health experts' recommendations to expand the CFBAI to address advertising to youth beyond child-directed programming⁽²⁵⁾ and WHO recommendations to consider adolescents in policy proposals to reduce youth exposure.⁽⁸⁾ In addition, further improvements in the nutritional quality of products advertised during children's programming would greatly benefit black children who also watch more child-directed programming. Expanded programming to attract more black and white preschoolers and children to networks with little or no advertising, such as Disney Channel and Nick Jr., would also help reduce young children's exposure to unhealthy food advertising. Furthermore, TV networks that attract large numbers of black youth could establish nutrition standards for advertised foods and/or provide incentives for healthy food advertising. Finally, public health education to increase awareness of high rates of unhealthy food advertising on specific TV networks widely viewed by youth would help parents, pediatricians, teachers and other caregivers protect young people from the negative impact of food marketing.

Conflicts of Interest Statement

There are no conflicts of interest to report.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1. Amount of advertising exposure by category for black and white youth on all networks^a

Table S2. Amount of black youth exposure to food and beverage advertising by network type^a