



Exposure to food advertising on television: Associations with children's fast food and soft drink consumption and obesity

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ABSTRACT

There is insufficient research on the direct effects of food advertising on children's diet and diet-related health, particularly in non-experimental settings. We employ a nationally-representative sample from the Early Childhood Longitudinal Survey–Kindergarten Cohort (ECLS-K) and the Nielsen Company data on spot television advertising of cereals, fast food restaurants and soft drinks to children across the top 55 designated-market areas to estimate the relation between exposure to food advertising on television and children's food consumption and body weight. Our results suggest that soft drink and fast food television advertising is associated with increased consumption of soft drinks and fast food among elementary school children (Grade 5). Exposure to 100 incremental TV ads for sugar-sweetened carbonated soft drinks during 2002–2004 was associated with a 9.4% rise in children's consumption of soft drinks in 2004. The same increase in exposure to fast food advertising was associated with a 1.1% rise in children's consumption of fast food. There was no detectable link between advertising exposure and average body weight, but fast food advertising was significantly associated with body mass index for overweight and obese children (≥ 85 th BMI percentile), revealing detectable effects for a vulnerable group of children. Exposure to advertising for calorie-dense nutrient-poor foods may increase overall consumption of unhealthy food categories.

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1. Introduction

Public health experts increasingly call for substantial changes in the food environment to effectively address the epidemic of obesity and poor diet among young people (Frieden et al., 2010; Goldberg and Gunasti, 2007; Story et al., 2008). Many consider the volume of marketing for calorie-dense nutrient-poor foods targeted to children and adolescents to be one of the most pernicious environmental influences on food consumption by youth (Harris et al., 2009a; Swinburn et al., 2008). A recent White House Task Force on Childhood

Obesity Report to the President highlights the need for additional research to establish the link between advertising and “food preferences and consumption by children and adolescents” (White House Task Force on Childhood Obesity, 2010). A substantial body of literature consistently demonstrates that food marketing increases children's preferences, requests to parents and choices of advertised brands; however, far fewer studies have examined effects of food marketing on consumption of food categories (Hastings et al., 2003; Institute of Medicine, 2006).

Recent research provides indirect evidence that food marketing can have a significant impact on unhealthy food consumption in children in the short-term (Epstein et al., 2008; Halford et al., 2004, 2007; Harris et al., 2009b). There is also evidence of long-term effects: television exposure in middle and high school predicts

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increased consumption of foods commonly advertised to youth five years later (Barr-Anderson et al., 2009). One study found that adiposity in children increased with exposure to fast food advertising and that banning those advertising practices could reduce the incidence of childhood overweight by 18% (Chou et al., 2008). This is true even though descriptive studies show that exposure to food advertising by children and adolescents has remained stable and may even slightly declined (Desrochers and Holt, 2007; Holt et al., 2007; Zywicki et al., 2004). Yet “Holt et al. (2007) do not directly address the postulated link between ad exposure and food consumption or other behaviors that may be related to obesity” (Desrochers and Holt, 2007, p. 198), which we explore in the current analysis. They also do not account for a host of other factors occurring simultaneously in the time period that may be affecting both changes in advertising and obesity.

As a whole, prior research suggests that food advertising likely has significant negative effects on young people's diet, body weight, and health. The 2006 Institute of Medicine (IOM) report concluded that there was substantial evidence that “food and beverage marketing influences the preferences and purchase requests of children, influences consumption at least in the short term, is a likely contributor to less healthful diets, and may contribute to negative diet-related health outcomes and risks” (p. 307). This evidence has motivated public health efforts to advocate for a significant reduction in child exposure to advertising for energy-dense nutrient-poor foods, including possible government regulation if current self-regulatory industry efforts do not substantially improve the marketing landscape. Important support for these efforts can be provided by further direct evidence that food advertising increases consumption of the unhealthy food categories most commonly promoted to youth. The IOM report goes on to say that “[n]ew research is needed on food and beverage marketing and its impact on diet and diet-related health and on improving measurement strategies for factors involved centrally in this research” (p. 309). Our study is designed to contribute to the evidence and test the hypothesis that children's exposure to television food advertising is associated with higher consumption of highly advertised food categories, namely fast food and soft drinks. In doing so, we draw from newer, more comprehensive data previously unexploited in this area. Using a nationally-representative sample from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K) with food consumption data on 5th graders and The Nielsen Company (Nielsen) measures of children's exposure to food advertising, we estimate associations between exposure to TV advertising and children's food consumption and body weight. While we perform several robustness checks to address the potential endogeneity of advertising, data limitations render it difficult to attribute the effects found to causal mechanisms. We are therefore careful not to conclude that the associations provide definitive evidence of causality from advertising exposure to increased food consumption, but are suggestive of causal effects.

2. Methods

2.1. Participants

We used data from the ECLS-K, a nationally representative longitudinal study of kindergartners in 1998–1999 conducted by the National Center for Education Statistics. The children were followed from kindergarten entry in the fall of 1998 to the spring of the 8th grade (2007) with five intermediate assessments. The survey collected data from multiple sources, including children via questionnaires and direct assessment in school, their parents interviewed by phone, and teachers and school administrators surveyed through questionnaires. The ECLS-K participants were selected via a multistage probability sampling design and some racial/ethnic groups were oversampled. More details on the ECLS-K survey design are published elsewhere (Tourangeau et al., 2009).

The original fall-kindergarten sample included 19,684 participants, but due to sample attrition (non-response and children moving out of the original schools and not being selected for follow-up) the spring-fifth grade sample consisted of 12,029 eligible children and 11,820 of them participated (Tourangeau et al., 2009). We removed respondents missing data for any of the following measures: body weight or height ($N = 820^1$), consumption of fast food and soft drinks ($N = 570$), residential location ($N = 830$), TV viewing ($N = 930$), socio-demographic characteristics of the child ($N = 820$), and the child's mother ($N = 1100$; children could be missing multiple measures). After these exclusions 9760 children (82.6% of the original sample) remained eligible for analysis. Children excluded due to missing data were less likely to be of Asian origin or live with a married mother and were more likely to live in the South.

Advertising data were merged using geocoded data from the ECLS-K in 2002 (3rd grade) and 2004 (5th grade). Advertising years 2002 and 2003 were merged with 2002 ECLS-K data, while advertising year 2004 was merged with 2004 ECLS-K data. In that sense, with the exception of the possibility that a child moved between 2002 and 2003, advertising exposure is captured in the designated market area of the child's residence.

2.2. Measures

2.2.1. Dependent variables

2.2.1.1. Food consumption. Children completed a food consumption questionnaire that assessed consumption of fast food, soft drinks (including fruit and sports drinks; referred throughout by “soft drinks”), milk, 100% fruit juice, fruit, and vegetables at any venue (home, school, restaurants). We used fast food and soft drinks due to their large share in children's diet and associations with poor nutrition and obesity (Collison et al., 2010).

For soft drinks, children were asked: “During the past 7 days, how many times did you drink soda pop

¹ All unweighted sample size numbers are rounded to the nearest ten according to our license agreement for the restricted-use ECLS-K data.

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