

Teaching children about good health? Halo effects in child-directed advertisements for unhealthy food

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Summary

Background: Food companies often use healthy lifestyle messages in child-directed advertising, raising public health concerns about health halo effects for nutrient-poor food/drinks.

Objective: Examine effects of health messages promoting nutrient-poor foods in child-directed advertising.

Methods: Randomized controlled experiment ($N = 138$). Children (7–11 years) viewed three child-friendly commercials in one of three conditions: (1) health halo (unfamiliar nutrient-poor food/drink ads with healthy messages); (2) nutrient-poor food/drink ads with other messages and (3) healthy food/drink ads. They rated the commercials and advertised products, provided attitudes about exercise and nutrition and consumed and rated healthy and unhealthy snack foods.

Results: Children in the health halo condition rated the advertised nutrient-poor products as significantly healthier compared with children in other conditions ($p = .003$), but the other commercials did not affect children's attitudes about other advertised products (p 's $> .50$). Child age, gender or TV viewing habits did not significantly predict their ratings (p 's $> .18$). There was no evidence that healthy lifestyle messages and/or healthy food commercials improved children's attitudes about nutrition, exercise or healthy snack consumption.

Conclusion: Promoting healthy lifestyle messages in child-directed commercials for nutrient-poor food/drinks likely benefits brands by increasing products' perceived healthfulness, but these ads are unlikely to positively affect children's attitudes about health and nutrition.

Keywords: Food preferences, health promotion, nutrition, television advertising.

Introduction

An increasing body of research has documented the vast amount of marketing for nutritionally poor food and drinks aimed at children(1,2) and its harmful impact on their diets and health(3). Therefore, public health experts propose regulations to limit unhealthy food marketing to children, also citing limitations of existing industry self-regulatory program(4,5). In addition to advertising healthy food to children, experts also call on the food industry to promote nutrition and physical activity messages in food advertising to children as a potential solution(6,7). In response, the U.S. Children's Food and Beverage Advertising Initiative (CFBAI) food industry self-regulatory program identifies 'healthy lifestyle messaging' that promotes physical activity and/or good dietary habits to children as a program goal(8). In an assessment of

food marketing to children, the U.S. Federal Trade Commission reported numerous company actions to encourage healthy eating and lifestyle choices by children and teens, such as partnerships with local youth-oriented organizations, school-based programs for nutrition education, depicting brand spokes-characters engaged in physical activity and supporting athletic events and programs(1). The World Health Organization also recommends that Member States develop policies to reduce the negative impact of marketing foods high in sugar, fats or salt on children by reducing children's exposure to such marketing as well as regulating the content of marketing messages that increase the power of those communications(9).

Few would argue against promoting good nutrition and physical activity to children. However, these actions raise public health concerns when they

accompany child-directed marketing for nutritionally poor food/drinks as they could increase positive attitudes about these products. In particular, using health promoting messages in advertising for nutrient-poor products, such as depicting children engaging in sports and then going out for fast food to celebrate, or an ad for sugary cereals that also shows fruit and milk on the table, may cause children to infer that these products are healthy, also known as ‘health halo’ effects. In analyses of child-directed food commercials in the United States, approximately one-half featured health cues(10), and these cues appeared most often in advertising for nutritionally poor foods, including sugary cereals and fast food(11). In total, 86% of U.S. TV ads for food and drinks seen by children promoted products high in saturated fat, sugar or sodium(12); and three-quarters of food ads shown on children’s TV programming promoted high-calorie, nutrient-poor products(13). Furthermore, most nutrition and physical activity actions by food companies cited in the Federal Trade Commission report(1) were sponsored by brands with products that contribute to poor health outcomes, including fast food, candy and snack foods.

Research on health halo effects resulting from nutrition and healthy lifestyle messages in marketing for nutritionally poor food and drinks indicates reason for concern. In one study, children (ages 5–6 and 10–11 years) who watched a sugary cereal commercial that depicted physical activity were more likely to believe the product was healthy compared with children who saw another commercial for the same product(14). For younger children, the physical activity ad also increased liking of the product. Another study found that depicting more nutritious kids’ meal options in fast-food commercials increased children’s reported liking of fast food generally(15). A study of product packaging for nutrient-poor food aimed at children found that nutrient content claims increased children’s perceptions of overall product healthfulness(16). Studies with adults have also shown that nutrition messages in marketing for unhealthy foods increase consumer perceptions of products’ healthfulness, including ratings of health-related attributes not explicitly mentioned in the messages (e.g., calories)(17–19). Studies have also shown that adults may consume more unhealthy food and/or more calories when marketing messages associate products with health or fitness(20–22), but this effect has not been examined with children.

Furthermore, research has not confirmed that nutrition and/or physical activity messages in marketing increase children’s understanding of good

nutrition, or their intent to eat healthfully or exercise more. In the study cited previously, commercials for more nutritious kids’ meals *did not* cause children to indicate they would choose the healthier options(15). In another study, most children accurately rated the healthfulness of a range of snack options, but accuracy did not predict healthy or unhealthy snack choices(23). There is some evidence that advertising for nutritious foods may have positive benefits. One study found that children consumed more of healthy snacks after playing an online game promoting a fruit brand(24), although a similar study failed to replicate this finding(25). In contrast, numerous studies have demonstrated that children consume greater amounts of unhealthy snack food during and after viewing commercials for nutrient-poor food(26). Together, these findings suggest that healthy lifestyle messages in child-directed marketing for nutritionally poor food/drinks may not effectively teach children about nutrition and good health, but could produce health halo effects, leading children to perceive nutrient-poor foods as more healthful and perhaps more appealing in other ways.

The present research examines three related questions (1) Do nutrition and/or physical activity messages in child-directed TV commercials for nutrient-poor food/drinks also produce health halo effects for unfamiliar foods with children? (2) Do these messages increase other positive attitudes about advertised products? (3) Does exposure to advertising with healthy lifestyle messages and/or advertising that promotes healthful food/drinks positively affect children’s health-related attitudes or behaviours more broadly?

Methods

This study used a randomized controlled experimental design to compare effects of advertising exposure in three conditions differing by type of commercial viewed (1) health halo commercials (i.e., unhealthy food/drink ads with healthy lifestyle messages); (2) commercials for similar products with another message (not health-related) and (3) healthy food/drink commercials. Participating children (ages 7–11 years) watched three commercials, answered questions about the advertised products and received a snack consisting of both healthy and unhealthy options. These ages were selected to evaluate responses by children who are covered by CFBAI industry self-regulation (ages 6–11 years), excluding younger children who could not read and respond to survey questions on their own.

Commercial selection

For Conditions 1 and 2, researchers identified child-friendly commercials for similar nutrient-poor food/drinks. Condition 1 commercials included a message promoting nutrition (such as images of fruit and a wheat field, and references to vitamins, whole foods and no artificial colours) and physical activity (including active children on a playground, marching and dancing). The commercials in Condition 2 used a child-friendly message (e.g., humour, fun) unrelated to health. To minimize potential pre-existing attitudes and knowledge about product attributes, researchers selected commercials from other English-speaking countries for products not widely available in the United States. For Condition 3, researchers identified child-friendly ads for products that qualified as healthy snacks and drinks, according to the U.S. Department of Agriculture Smart Snacks in Schools nutrition standards(27). Due to very limited availability of child-friendly ads promoting healthy foods in any of the English-speaking countries, both U.S. and non-U.S. products were included in Condition 3. Limited availability of child-friendly healthy food commercials also restricted researchers' ability to control the messages used. Therefore, these commercials included both health promoting and other child-friendly messages.

To finalize commercial selection, researchers conducted two online surveys of parents with children (ages 8–11 years) to assess attitudes about potential commercials and the advertised products (see Supplemental Information for detailed methods, pretest ratings and descriptions of selected commercials). Pretest interviews with a convenience sample of 12 children (ages 8–11 years), conducted July 2015, confirmed positive attitudes about the selected commercials and advertised products, using questions adapted from previous children's consumer behaviour research(28–30). Children rated commercial liking using 5-point 'smiley face' scales (1 = 'I hate it' to 5 = 'I love it'), feelings about the commercial (1 = 'very sad' to 5 = 'very happy') and expected liking of advertised products (1 = 'I would hate it' to 5 = 'I would love it'). Children also indicated whether they would ask mom or dad to buy the product and if mom or dad would buy it (options: yes, no, don't know). Cognitive survey testing confirmed that children understood the survey questions and could answer them appropriately.

Main study protocol

Participants included 138 children (Table 1), recruited in a mid-size Northeastern city from August 2015 to

Table 1 Characteristics of 138 7- to 11-year-old children and their parents

Characteristic	Value
Child age, mean (SD), years	9.4 (1.2)
Male, %	51
Child race/ethnicity*, %	
White only	62
Black only	14
Hispanic only	17
Other/mixed	7
Language spoken at home, %	
English only	90
Spanish	5
Other	5
Media in the bedroom, %	
None	37
TV	24
Other (computer, tablet, or smartphone)	51
Eats in room with TV, mean (SD), days/week	
Meal	2.3 (2.4)
Snack	2.9 (2.3)
Daily media usage, mean (SD), hours	
TV	4.1 (2.4)
Total media	5.0 (8.4)
Parent female, %	92
Parent education, %	
High school only	7
Some college or college degree	38
Post-graduate	55

*Race/ethnicity of parent if child did not answer.

Participants included 138 7- to 11-year-old children who were randomly assigned to one of the three experimental conditions.

March 2016. Researchers screened interested participants for study requirements (children's age, reading ability, access to the research centre and no food allergies). Participants received an incentive of \$30 plus travel expenses. Researchers described the study procedures to the parent and child together and received verbal consent. Parents also provided written informed consent, while children read and signed an age-appropriate consent form. The university's human subjects committee approved all procedures. Table 1 provides participant characteristics.

Each child was randomly assigned to one of three experimental conditions (1) health halo commercials; (2) unhealthy food commercials with another message and (3) healthy food commercials. Children watched the commercials on a large monitor in an otherwise empty room alone with no distractions. They viewed each commercial twice and then answered questions about the commercial just watched (using the

pretested questionnaire). After the child completed these questionnaires, the researcher provided a snack consisting of two healthy options (carrots and grapes, 100 g each), two unhealthy options (potato chips and mini-chocolate chip cookies, 50 g each) and two options considered moderately healthy (fruit snacks and goldfish crackers, 50 g each). The researcher placed the snacks in individual bowls (without identifying brand information) randomly on the table in front of the child; informed him/her that it was 'snack time' and they could eat as much as they wished; and left the room. These snacks and the protocol had been used in a previous study assessing advertising effects on children's food consumption(24).

After 5 min, the researcher returned with another questionnaire that asked the children to rate how much they liked the taste of the snacks they just ate. Children then indicated their agreement with two statements: 'It's important to exercise every day' and 'It's important to eat fruits and vegetables every day'. All responses used the 5-point smiley face scale. Children also provided information about media in their bedrooms, other media use and demographics. Children continued their snack while completing this questionnaire, receiving 20 total minutes for ad libitum eating. The researcher then removed the snacks and provided a final questionnaire that asked them to rate the healthfulness of the six snacks they received and the food/drinks in the ads for all three conditions (including products in commercials they did not see) using a 5-point smiley face scale (1 = unhealthy to 5 = healthy) with an option for 'I don't know'. Researchers weighed the snacks afterwards to measure amount consumed.

One-way analyses of variance (ANOVAS) assessed differences by condition for children's healthfulness ratings and other attitudes about advertised food/drinks; attitudes towards the commercials and other health-related attitudes and behaviours (including taste and consumption of healthy snacks). Post hoc Bonferonni corrections identified significant differences between individual conditions. Researchers summed responses for the three products in each condition and also analysed each product separately. Researchers also included child characteristics as categorical variables in separate 2 (child characteristic) \times 3 (condition) ANOVAS to test for main and moderating effects of child gender, age (7–9 and 10–11 years) and weekly TV viewing (above vs. below median).

Results

The results confirmed health halo effects of using nutrition and physical activity messages in child-directed

commercials for nutrient-poor food/drinks (Table 2). Children who viewed the health halo commercials (Condition 1) rated the products in those ads as significantly healthier overall than did children who saw the other commercials (both Conditions 2 and 3). This difference was statistically significant for two individual products: McVities cookies and Ribena fruit drink (Fig. S1). Although the difference between conditions was not statistically significant for LCM bars alone, the pattern was consistent with the other products in this condition. In contrast, commercial viewing did not affect healthfulness ratings for any of the nutrient-poor foods advertised in Condition 2 (commercials with other, not health-related, message) or the healthy foods in Condition 3 (all p 's > .33). In addition, there were no main effects of child gender, age or TV viewing on healthfulness ratings nor interactions with condition (all p 's > 0.18).

Children's agreement that mom or dad would buy the advertised foods also differed significantly between all conditions. Notably, children believed that their parent would buy 1.1 of the advertised products in the health halo condition vs. 0.4 products in the unhealthy food/other message condition. As expected, children were more familiar with the three healthy food/drinks in Condition 1, but 7% or fewer indicated that they had seen any of the food/drinks advertised in the other two conditions, confirming few if any pre-existing attitudes about the products in Conditions 1 and 2.

However, there were no other significant differences by condition in children's ratings of the advertised food/drinks or the commercials. On average across the three conditions, children indicated that they would ask their parent to buy 1.3–1.4 of the three advertised foods. Children also liked the commercials in all three conditions and believed they would like the taste of the advertised food/drinks.

Health-related attitudes and consumption

Furthermore, this study found no evidence that the health-promoting messages in Condition 1 commercials or the healthy food commercials (Commercial 3) affected children's health-related attitudes or behaviours more broadly (Table 3). Nearly all children agreed that it is important to eat fruits and vegetables and to exercise every day, and there were no differences in healthfulness ratings of either healthy or unhealthy snacks.

Similarly, the commercials did not affect children's ratings of how much they liked the healthy or unhealthy snacks offered. On average, children liked

Table 2 Effects of commercial type on attitudes about advertised food

	Commercial condition						F-value; effect size; p-value
	1) Unhealthy foods – Health halo n = 46		2) Unhealthy foods – Other message n = 47		3) Healthy foods n = 45		
	M	(95% CI)	M	(95% CI)	M	(95% CI)	
Children's responses							
Healthfulness ratings of advertised foods (1–15, combined):							
Foods in Condition 1 ads (health halo)*	9.84	(9.00–10.68)	8.17	(7.36–8.97)	8.15	(7.35–8.94)	F(2,94) = 6.06; partial η^2 = 0.12; p = .003
Foods in Condition 2 ads (unhealthy – other message)	6.29	(5.42–7.15)	5.70	(4.94–6.45)	5.79	(5.02–6.57)	F(2,112) = 0.63; p = 0.54
Foods in Condition 3 ads (healthy)	12.41	(11.76–13.06)	12.12	(11.44–12.79)	12.53	(11.81–13.25)	F(2,111) = 0.41; p = 0.67
Purchase attitudes (0–3):							
Mom or Dad would buy [†]	1.07	(0.79–1.34)	0.38	(0.80)	1.69	(1.38–2.00)	F(2,135) = 23.33; partial η^2 = 0.26; p < .001
I would ask Mom or Dad to buy	1.28	(0.97–1.59)	1.30	(0.99–1.60)	1.38	(1.04–1.71)	F(2,135) = 0.10; p = 0.90
Ratings of commercials (1–15, combined):							
I liked the ad	11.30	(10.74–11.87)	11.32	(10.60–12.04)	11.02	(10.25–11.80)	F(2,135) = 0.24; p = 0.79
How the ad made me feel	11.96	(11.43–12.48)	12.00	(11.42–12.58)	11.49	(10.86–12.12)	F(2,135) = 0.96; p = 0.39
I would like the taste of the advertised food	11.04	(10.46–11.63)	11.30	(10.58–12.02)	10.60	(9.75–11.45)	F(2,135) = 0.97; p = 0.38

*Condition 1 is significantly different from Conditions 2 and 3 (p's = .01), after Bonferroni corrections, but the difference between Condition 2 and Condition 3 is not significant.

[†]All differences between conditions are significant (p's < .01), after Bonferroni corrections.

Healthfulness ratings of advertised foods differed significantly between conditions for nutrient-poor food/drinks advertised using healthy lifestyle messages (i.e., health halo condition), but not for nutrient-poor food/drinks advertised using other messages nor healthy food/drinks.

Table 3 Effects of commercial type on children's health and nutrition outcomes*

	Commercial condition					
	1) Unhealthy foods – Health halo		2) Unhealthy foods – Other message		3) Healthy foods	
	M	(95% CI)	M	(95% CI)	M	(95% CI)
Eat fruits and vegetables every day	4.93	(4.85–5.00)	4.87	(4.72–5.00)	4.80	(4.59–5.00)
Exercise every day	4.81	(4.66–4.97)	4.87	(4.76–4.99)	4.80	(4.62–4.98)
Healthfulness ratings (1–10, combined)						
Healthy snacks (carrots and grapes)	9.68	(9.39–9.98)	9.92	(9.83–10.00)	9.81	(9.52–10.09)
Unhealthy snacks (potato chips and cookies)	3.15	(2.68–3.62)	3.36	(2.91–3.82)	3.13	(2.69–3.56)
Moderately healthy (fruit snacks and goldfish crackers)	5.73	(5.17–6.28)	5.36	(4.80–5.91)	5.23	(4.64–5.82)
Taste ratings (1–10, combined)						
Healthy snacks (carrots and grapes)	7.80	(7.37–8.22)	7.98	(7.49–8.47)	8.27	(7.74–8.80)
Unhealthy snacks (potato chips and cookies)	8.61	(8.18–9.05)	8.64	(8.14–9.14)	8.58	(8.11–9.05)
Moderately healthy (fruit snacks and goldfish crackers)	8.66	(8.27–9.05)	8.64	(8.20–9.08)	8.09	(7.57–8.61)
Amount consumed (g)						
Healthy snacks (carrots and grapes)	67.5	(52.4–82.6)	81.7	(66.1–97.3)	81.7	(64.4–98.9)
Unhealthy snacks (potato chips and cookies)	43.6	(36.2–51.0)	37.5	(29.7–45.4)	42.2	(34.9–49.4)
Moderately healthy (fruit snacks and goldfish crackers)	44.2	(37.1–51.2)	41.4	(35.3–47.6)	40.7	(33.4–48.0)
						F-value
						$F(2,131) = 0.74$
						$F(2,131) = 0.29$
						$F(2,126) = 1.05$
						$F(2,121) = 0.82$
						$F(2,122) = 0.35$
						$F(2,132) = 0.97$
						$F(2,133) = 0.02$
						$F(2,133) = 2.03$
						$F(2,135) = 1.06$
						$F(2,135) = 0.74$
						$F(2,135) = 0.29$
						$F(2,135) = 0.75$

*There were no significant differences by condition on any of these measures.

Healthy lifestyle advertising messages and advertising for healthy food/drinks did not increase children's attitudes about the importance of healthy eating or exercise, or their ratings or consumption of healthy and unhealthy snacks.

the taste of all the foods they sampled, ranging from $M = 3.75$ out of 5 (95% CI [3.56–3.94]) for carrots to $M = 4.35$ (95% CI [4.19–4.51]) for cookies. In addition, the commercials did not affect the amount of healthy or unhealthy snacks consumed (all p 's > 0.30). On average, children consumed somewhat less healthy food ($M = 77.0$ g carrots and grapes, $SD = 54.0$) than other foods ($M = 83.2$ g, $SD = 36.6$).

Discussion

As predicted, messages about nutrition and physical activity in child-directed commercials for nutrient-poor food/drinks created health halo effects. Viewing these commercials caused children to rate the products as more healthful compared with participants who did not see the commercials. However, commercial exposure did not affect perceived healthfulness of familiar healthy products or the unfamiliar nutrient-poor products with other (not health-related) messages. Furthermore, effects were consistent regardless of children's gender, age and TV viewing. Children's attitudes about the commercials or expected liking of advertised products does not explain the lack of significant effects as these ratings did not differ by condition. Notably, children were more likely to indicate that their parents would purchase the advertised nutrient-poor products with health halo messages than similar products with other messages.

Furthermore, this study found no evidence that healthy lifestyle messages or commercials for known healthy foods influenced health-related attitudes or behaviours more broadly. This finding contrasts with one previous study showing that playing online advergames promoting healthy food increased healthy food consumption(24), but supports other studies that failed to find effects(15,25). One potential explanation could be ceiling effects on measures of children's attitudes about physical activity and healthy eating, which nearly all children strongly agreed are important. Similarly, all children understood that fruits and vegetables are healthier than the other snacks provided. As in some previous studies(23,24), children in this study consumed similar amounts of healthy and unhealthy food and indicated that they liked or would like the taste of the healthy foods consumed and advertised regardless of commercials viewed. These findings suggest few potential incremental effects from either messages that reinforce the importance of eating healthy or commercials for known healthy foods. Although further research is required to conclude that these ads never have positive effects, this study reinforces previous findings that utilizing healthy lifestyle messages to promote

nutrient-poor food and drinks is unlikely to encourage healthy eating by children. Future research could also examine effects of healthy lifestyle messages used in other popular forms of child-directed marketing for nutrient-poor food/drinks, such as product packaging, in-school rewards programs, mobile apps and social media.

This research has limitations. Using existing commercials increased external validity, but also limited researchers' ability to show commercials that differed only on attributes of interest (i.e., message, product healthfulness). Researchers identified just one non-U.S. product with two child-friendly commercials with and without a health-promoting message (McVities). Although similar products (two fruit drinks and two types of LCM bars) were used in Condition 1 and 2 commercials, other product and packaging features (e.g., pictures of grapes on the Ribena bottle vs. Fruit Shoot's bright colours or chocolate on 4D Choc bars) may also have affected perceptions of healthfulness. However, children saw the same package for each product in all conditions when rating the products, so differences between conditions can be attributed to effects of the commercial message alone due to the randomized controlled experimental design. Furthermore, utilizing unfamiliar products in Conditions 1 and 2 ensured that participants did not have pre-existing knowledge about product attributes to minimize these effects. Another limitation is that participants were familiar with the healthy products advertised in Condition 3 and the commercials included both healthy lifestyle and other messages (due to very limited availability of English-language child-friendly commercials for healthy foods). However, this design allowed for a valid comparison of effects of commercials for the types of less nutritious food/drinks commonly advertised to children (with and without health-promoting messages), while comparisons with commercials for known healthy products showed the direction of these effects (i.e., health-promoting messages increased perceived healthfulness).

This research extends previous health halo research and confirms potential adverse effects of healthy lifestyle messages in child-directed commercials for nutrient-poor foods. Furthermore, it supports existing literature that has failed to provide evidence that health-promoting messages or healthy food advertising positively affect children's health-related attitudes or eating behaviours. Companies should not promote physical activity or good nutrition in child-directed advertising for nutrient-poor food/drinks as this practice likely increases children's positive attitudes about unhealthy brands, and does not benefit children's diet

or health. Such practices should be discouraged, including through industry self-regulatory programs such as the CFBAI.

Conflict of interest statement

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Author contributions

Dr. Harris conceptualized and designed the study, conducted the analyses and drafted, revised and approved the final manuscript.

Ms. Haraghey managed the study logistics, supervised the remaining phases of data collection and reviewed and edited the manuscript.

Ms. LoDolce designed the data collection instruments, coordinated and supervised the first phase of data collection and reviewed the manuscript.

Ms. Semenza coordinated the recruiting, conducted the initial analyses and reviewed the manuscript.

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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. Description of commercials and pretest results

Figure S1. Perceived healthfulness of individual advertised foods by commercial condition