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RESEARCH ARTICLE

## Children's Perception of Food Marketing Across Digital Media Platforms



Jennifer E. Carroll, PhD,<sup>1</sup> Jennifer A. Emond, PhD,<sup>2,3</sup> Linda L. Griffin, PhD,<sup>4</sup>  
Elizabeth R. Bertone-Johnson, ScD,<sup>1,5</sup> Nicole A. VanKim, PhD,<sup>1</sup> Susan R. Sturgeon, DrPH<sup>1</sup>

**Introduction:** Exposure to food marketing increases the risk of poor diet. Children's perception and interpretation of food marketing across digital media platforms is understudied. Children aged 9–11 years are uniquely susceptible to food marketing because children may watch content alone, and it is unclear whether embedded ads are decipherable by children (e.g., social media influencers) and if children are receptive to advertisements.

**Methods:** The authors collected data from 21 child–parent dyads in 2022 to fill this gap. Children were interviewed about their food marketing exposure and media use and were asked to share their perspectives on food advertisements. Parents completed a survey for household digital devices, demographics, and perception of their child's food advertising knowledge.

**Results:** This study found that all children generally recognized direct food advertisements, could describe them with varying levels of confidence, and shared examples. Despite self-identifying ads and understanding the intent of advertising, many children are still receptive to advertisements on the basis of engaging content (e.g., liking the ads as entertainment, watching ads even when given the chance to skip the ad) and the food items marketed (e.g., liking the taste of foods).

**Conclusions:** These findings suggest that knowledge of advertisement exposure and intent of advertising are not sufficient to reduce receptiveness of unhealthy food ad exposure. Additional research on the potential impacts of embedded ads, such as through social media influencers, is needed to understand children's interaction with the current digital media landscape.

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## INTRODUCTION

Among U.S. children aged 6–11 years, the prevalence of being overweight or obese is approximately 34.2%.<sup>1</sup> Foods that are highly processed and unhealthy are heavily marketed to children, and exposure to food advertisements can influence children's preferences, tastes, and habits.<sup>2,3</sup> Food advertising increases the risk of having a lower-quality diet and may increase the risk of childhood obesity.<sup>4–8</sup> Foods are marketed to children through TV, online, on social media, and in supermarkets, among other places, and the use of celebrity endorsers is a popular marketing strategy.<sup>9</sup>

From the <sup>1</sup>Department of Biostatistics and Epidemiology, School of Public Health & Health Sciences, University of Massachusetts Amherst, Amherst, Massachusetts; <sup>2</sup>Department of Biomedical Data Sciences, Geisel School of Medicine, Dartmouth College, Hanover, New Hampshire; <sup>3</sup>Department of Pediatrics, Geisel School of Medicine, Dartmouth College, Hanover, New Hampshire; <sup>4</sup>Department of Student Development, College of Education, University of Massachusetts Amherst, Amherst, Massachusetts; and <sup>5</sup>Department of Health Promotion and Policy, School of Public Health & Health Sciences, University of Massachusetts Amherst, Amherst, Massachusetts

Address correspondence to: Jennifer E. Carroll, PhD, Department of Epidemiology, School of Public Health & Health Sciences, University of Massachusetts Amherst, Arnold House, 715 North Pleasant Street, 4<sup>th</sup> floor, Amherst MA 01003. E-mail: [jecarroll@umass.edu](mailto:jecarroll@umass.edu).

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Importantly, studies show that exposure to food advertising increases intake of those advertised foods.<sup>3,5,6,10–12</sup> Children are particularly susceptible to unhealthy food advertisements because they may watch content alone and may not always be able to understand the persuasive intent of marketing.<sup>13,14</sup> In addition, there is substantial research on advertising and cognitive abilities<sup>15–17</sup> in children; yet, children's ability to distinguish advertising from entertainment, especially on newer media platforms, has been questioned.<sup>14,15,18</sup>

Children are spending a lot of time on screen media, which may subsequently increase the risk of marketing exposure. Total daily screen time for children aged 8–12 years in 2021 was estimated to be 5 hours and 33 minutes.<sup>19,20</sup> Online videos and social media (e.g., YouTube, Instagram, TikTok, etc.) are now top media sources for preadolescents.<sup>19</sup> Marketing on these platforms is often integrated into the content and may be harder for children to recognize as marketing.<sup>21</sup> For example, unhealthy food marketing (e.g., sugary cereals, McDonald's fast food) was found within commercial educational websites (e.g., ABCya!, PopTropica.com) that were used by children during the coronavirus disease 2019 (COVID-19) pandemic.<sup>22</sup> In an online randomized trial, adolescents could not identify Instagram posts that were unhealthy food ads.<sup>23</sup> Unhealthy brands are also using their own TikTok accounts to market their products and are encouraging users to create and share their own content that features the branded products.<sup>24</sup> Adolescents engage with brands on social media by liking posts by brands and commenting on brand content. Those interactions also increase as the time spent on social media increases.<sup>25</sup> Children aged 9–11 years may also be responsive and interested in these ads as they develop their independence with the media. In this age group, there is a lack of data on children's interpretation of food marketing, with the basis of children's understanding of marketing largely through cognitive models, as opposed to children's own perspectives.

Therefore, this study's objectives were to qualitatively assess preadolescent children's (aged 9–11 years) understanding and receptiveness of food marketing across digital media platforms they currently use. The authors examined children's self-reported identification of food marketing, attitudes about food marketing, and actions related to food marketing exposure.

## METHODS

### Study Sample

Participants were recruited through Facebook advertisements, newsletters, and community flyers (e.g., public library) between March and May 2022 for a qualitative

study assessing the perceptions of food marketing for children aged 9–11 years. The study goals were powered for data saturation between each subset of children aged 8–10 years,<sup>26</sup> the point when the interviewer recognizes hearing similar statements from the participants. Eligible participants were English speaking and aged 9–11 years and 1 parent each who resided within 30 miles of the study site and had no severe food aversions. Parents were screened for eligibility by phone. Overall, 33 parents responded, and 25 scheduled a screening call; of those, 21 parent–child dyads were screened, and all enrolled (84% of those agreed to be screened). Children participated in an online interview, and parents completed an online survey. Informed written consent was obtained from all participants. Children received a \$10 Amazon gift card. The University of Massachusetts Amherst Human Research Protection Office approved this study (Protocol Number 2749.)

### Data Collection

The interview was conducted using a pretested, semi-structured interview guide ([Appendix](#), available online). The authors informed children that they were interested in digital media on recruitment materials, during the screening call, on the consent forms, and during the interview. Questions included asking about what shows they watched, what it was watched on, and whether they recalled any food advertisements. More questions were asked during the interview than are presented in this paper. Some questions were more general, such as asking about perceived quantities of food ads children thought they saw. For this, the authors were trying to gauge across the group whether children felt inundated by all the ads, did not see any ads, or were somewhere in the middle on the basis of their own self-perceived scale using simple language (e.g., if all children replied with no ads, we would see that as an interesting phenomenon to be further studied and reported). Children were able to elaborate or not on any given interview question, and responses were often repeated back to them for confirmation (i.e., member checking).<sup>27</sup>

Interviews were conducted virtually and lasted 15–30 minutes each, and a video was recorded for transcription.<sup>28</sup> MacWhisper (version 2.10, medium [English] language model) was used to transcribe the recordings, and the transcript was manually edited as needed. Pseudonyms were used for all children. A brief survey (basic demographics, household devices) was sent to parents using REDCap.<sup>29,30</sup> In addition, the authors requested from the children a screenshot of a food advertisement they saw digitally within a week of the interview, if they saw one, to confirm identification of a food advertisement.

## Data Analysis

After transcription, NVivo (Version 12.7.0) was used to understand child responses and identify themes and categories.<sup>31</sup> The authors started with open coding, where they tagged data that were relevant to the study. Then, they created categories from the data that they had previously tagged (axial coding), refined the categories as needed to create core categories (selective coding), and developed hypotheses about how the categories were related.<sup>26</sup> To generate initial codes, the authors used deductive (on the basis of interview guide) and semantic (on the basis of explicit meanings of the data) approaches. A conceptual map was created to help organize findings. The authors reflected on their positionality and reflexivity to self-reflect on any assumptions and biases during the interview and analysis.<sup>26,27</sup> Questionnaire data were analyzed using descriptive statistics using R Language for Statistical Computing (Version 4.2.2).<sup>32</sup>

## RESULTS

The study sample was a convenience sample and contained 21 children, including 5 aged 9 years, 7 aged 10 years, and 9 aged 11 years. Twelve were girls, and 9 were boys. For race and ethnicity, 15 children were non-Hispanic White; 1 preferred not to say; and 5 were mixed race, Black or African American, and/or of Hispanic/Latinx origin. Two parents reported having an education level of less than a high school diploma, 4 parents had a Bachelor's degree, and 15 had a graduate degree.

Children reported seeing ads while using many devices (e.g., tablets, laptops, game consoles, smartphones, streaming TV) and by accessing several platforms (e.g., YouTube, educational websites, other websites, TikTok, Instagram, Facebook). To provide some context about the children's perception of the amount of food ads children see on average, the authors asked the children whether they thought that they saw lots of food ads, some food ads, or not many food ads. Approximately one third of children fell into each category, with a couple of children stating that they do not see many food ads specifically but lots of ads for non-food items (e.g., toys, games, medicine). Several parents reported that they have streaming services without advertisements, may pay extra for no advertisements, have ad blockers, and may also limit screen time. Overall themes presented include (1) identification of food marketing, (2) attitudes about food marketing, and (3) actions related to food marketing exposure.

### Identification of Food Marketing

Fully determining whether something is an advertisement versus content was important in this study.

When children explained what a food advertisement was and provided examples (Table 1), this helped the authors to understand whether children were aware of being advertised to.

All children were able to describe advertising in their own words, either by providing an example or a definition, with varying levels of confidence and understanding (on the basis of accuracy of definitions provided in Table 1), for example, "I've seen the McDonald's ads and all those like big fast-food companies. The McDonald's ones, and like Starbucks, KFC."

Approximately half of the children submitted at least 1 food ad screenshot (ads not shown), all of which were direct ads. The remaining children reported not seeing a food ad in the 7 days after the interview, and 1 declined to participate. Throughout the interviews, there were very few examples of children mentioning food marketing that was embedded within the content of a video, suggesting that it is unclear whether children perceive and recall embedded ads similarly to direct food advertising. One of the few examples of an embedded ad from a social media influencer (with 1.31 million followers)<sup>33,34</sup> was when a child mentioned that their favorite YouTube video was about how people on the video will promote a new food brand of shoe, for example, "Twix made a shoe. So did Ruffles." When the authors further investigated these videos, they found examples of these promotions: tying unhealthy food items to products (i.e., shoes) that the children are interested in.<sup>33,34</sup>

Furthermore, children were asked to define what they thought food advertising was (Table 1). Persuasion to get you to buy stuff, business or company, and combinations of these were common subthemes among responses, for example, "I think that it's they like, exaggerate the features of the food to make you want to buy it and they make it look really good in the pictures and stuff," and, "It's to support their business, like get you to buy more things from their company."

To support children's examples of knowing what advertising is, the authors asked parents whether they thought that their children understood advertising. Most parents thought that their children always or mostly knew what advertising was (Table 2).

The authors also asked parents whether they thought that their children liked the foods advertised to them. Seven parents reported that their children definitely or mostly like the foods advertised to them, 11 parents reported sometimes or not really, and 2 parents were not sure.

The authors were interested to know what specific foods in the past 2 weeks children recalled seeing and their interpretation of healthy or unhealthy. The authors did not guide definitions because they wanted children's

**Table 1.** Interpretation of Food Marketing in Children and Quote Examples, Kid Study 2023

Category	Example quotes
Identification of food marketing	<p>Ad examples:</p> <ul style="list-style-type: none"> <li>• “I’ve seen one about cereal.”</li> <li>• “There was this one where I think it said, ‘We deliver food right to your house, carried by drones.’ And the drones actually blew my mind.”</li> </ul> <p>Examples of platform-specific ads:</p> <p>TikTok:</p> <ul style="list-style-type: none"> <li>• “I think once I might’ve for Doritos, but I think that’s it.”</li> <li>• “The same ones as YouTube, just like KFC, McDonalds, Subway.”</li> </ul> <p>Instagram:</p> <ul style="list-style-type: none"> <li>• “Sometimes it’s Oreos. They post stuff, like the new flavors they come out with.”</li> <li>• “It’s usually like ads like stop and shop ads. Or like Walmart, sometimes I see Walmart ads.”</li> </ul> <p>Themes among ad definitions:</p> <p>Persuasive examples to get you to buy stuff:</p> <ul style="list-style-type: none"> <li>• “I think it’s a way of how to get people to spend money on food that is junky.”</li> <li>• “They can show like videos or pictures, if they want you to buy something.”</li> <li>• “It’s like somebody trying to sell you food.”</li> <li>• “It’s when people show people short clips of food they want people to buy.”</li> <li>• “Sometimes, there’s an ad, and then they make you want to get a certain type of food.”</li> <li>• “I just think advertising is a way for people to try to make something more appealing because you can edit it and they know you’re going to be watching or reading the stuff on the internet. And there’s just so many people on the internet. It’s a good way to get something shown to so many people.”</li> </ul> <p>Business or company examples:</p> <ul style="list-style-type: none"> <li>• “Like a brand of food. Maybe like a Goldfish ad.”</li> <li>• “It’s trying to get kids to buy food from other companies.”</li> <li>• “Like when you’re talking about a company to try to get people to use that company and stuff.”</li> </ul> <p>Unhealthy and healthy ad examples:</p> <ul style="list-style-type: none"> <li>• “Lucky Charms. My favorite food ever!”</li> <li>• “Doritos. They’re unhealthy, I had some today.”</li> <li>• One child referred to a hamburger and fries saying: “Unhealthy but it is tasty.”</li> <li>• “I think I’ll just eat what I want to eat anyway.”</li> </ul>

own perspectives. Children self-categorized the advertised foods (Table 3) in a way that mostly aligned with general expectations of healthy or not healthy (e.g., fast foods: unhealthy, whole foods: healthy).

Most ad examples were highly processed foods<sup>35</sup> and could contribute excess sodium, sugar, or saturated fat to their diets. However, despite children identifying unhealthy foods, this did not deter all children from

potentially still wanting to consume the product: “Lucky Charms. My favorite food ever!”; “Doritos. They’re unhealthy, I had some today”; one child referred to a hamburger and fries saying, “Unhealthy but it is tasty”; and “I think I’ll just eat what I want to eat anyway.”

Some children qualified that it did not matter to them if the food was healthy or unhealthy. Across several children, flavor and taste were more important than healthiness.

**Table 2.** Parent Perception of Their Child’s Advertising Knowledge, Kid Study 2022

Parent perceptions	n (%)
Child understand what advertising is	
Definitely	14 (67%)
Mostly	4 (19%)
Some	3 (14%)
Child likes foods advertised to them	
Definitely	2 (10)
Mostly	5 (25%)
Some	7 (35%)
Not really	4 (20%)
Do not know	2 (10%)

## Attitudes About Food Marketing

**Annoyance and impatience.** In terms of emotional cues, being annoyed by food advertisements is one indication children may realize that they are being advertised to. Most children mentioned feelings of annoyance in their responses to how they felt being advertised to for foods (Table 4)

Examples include, “I find it somewhat annoying because I’ve been getting really just annoying ads,” and, “I was annoyed that it interrupted the movie mid-song.”

Some children mentioned that repetition or long advertisements are what made them annoyed, suggesting impatience as a theme in children’s responses: “When I

**Table 3.** Examples and Frequencies of Food Advertisements Children Aged 9–11 Years Mentioned During an Interview That They Have Seen, Kid Study, 2022

Unhealthy ads <sup>a</sup>	Count	Healthy ads <sup>a</sup>	Count
McDonald's	6	Salad, lettuce	3
Burger King	4	Shaw's	2
Wendy's	4	Walmart	2
KFC	2	Stop and Shop	1
Arby's	2	Target	1
Chick-fil-A	2	Nutrisystem	1
Dominos	1	Gatorade energy drink <sup>b</sup>	1
Pizza Hut	1	Plant Burger	1
Sonic	1	Coffee drink <sup>b</sup>	1
Starbucks	1	Sushi	1
Subway	1	Guacamole	1
Taco Bell	1	Papayas	1
Hardee's	1	Diluted watermelon-flavored juice	1
Dunkin' Donuts	1	Raisins	1
Ninety-Nine Restaurant	1	Water	1
Doritos chips	1		
Lays chips	1		
Tostitos chips	1		
Cheetos	1		
Goldfish	1		
Coke	1		
Oreo's	1		
M&M's	1		
Lucky Charms cereal	1		
Unknown brand - Energy drink	1		
Unknown brand - Sandwiches	1		
Unknown brand - Burger, fries	1		
Unknown brand - Hotdogs	1		
Unknown brand - Chicken	1		
Unknown brand - Cereal	1		
Unknown brand - Cookies	1		

<sup>a</sup>Foods categorized on the basis of children's perception of healthy or unhealthy.

<sup>b</sup>Questionable healthfulness of these products.

see new advertisements, I like to look at them. But otherwise, they mostly just repeat and repeat and repeat, and repeat again. That was kind of annoying.”

Interestingly, these feelings did not seem to impact how children perceived the content of the ads or the products being advertised. Some simply mentioned just wanting to get back to their content.

Furthermore, humor was a distinct factor in whether a child wanted to watch an advertisement or not and made commercials and products more interesting, entertaining, and tolerable, despite interrupting their content, for example, “If it is funny, I like it, but if it's not, I don't like it”; “Yeah, I like it if they're funny”; and, “Usually, a mixture between annoyed and humored.”

However, just because something was funny to a child, this did not seem enough to make the child want the product more or change their opinion of the healthfulness of the product; it just facilitated their desire to watch the advertisement before getting back to their content. The authors considered humor to be a feeling that mitigates feelings of annoyance. Overall, even though some of the children do not want to see advertising, they are not as discouraged by it when it is something of interest, entertaining to watch, or even embedded in their content. An example is, “It depends, I guess, if it's in the show and incorporated it, I mean I don't mind it because it's generally part of the show and has to deal with the plot but other times, when I'm watching TV, I don't like it because it's like interruptions.”

**Hunger.** Furthermore, some children mentioned that food advertisements made them feel hungry (Table 4). Even if they may cognitively understand that they are being advertised to, advertising may cause a physiologic response.

### Actions Related to Food Marketing Exposure

**Skip ad button.** How children interact with the skip ad button on YouTube and other platforms was an indicator of whether children knew that they were being advertised to. The authors asked children whether they saw a skip ad button and if they pressed it or not (Table 4): “I always hit it”; “Sometimes, I just get a little interested and I sit there for like 25 minutes watching the commercial. But, usually, if it's something boring, I'll just skip”; and “I let the ad play. I don't really mind.”

Over half of the children reported that they always hit the skip ad button, and just under half indicated that whether they found the commercial interesting, funny, or new, they would watch the ad, even if a skip ad button was available. Several children also mentioned that some ads that they would like to skip are not skippable and that other families purchase ad blockers and paid subscriptions for fewer advertisements.

**Ad warnings.** Children were asked whether an ad warning, a cue to let them know they are being advertised to, would be helpful for them. Responses included mostly negative responses (57%), such as, “Not really, I usually know for myself” (Table 4).

## DISCUSSION

In this study, the authors described children's identification, attitudes, and actions related to food marketing. The findings suggest that all the children aged 9–11 years in this sample recognized food marketing and were able to describe what they thought food



**Table 4.** Interpretation of Food Marketing in Children and Quote Examples, Kid Study 2023

Category	Example quotes
Attitudes about food marketing	<p>Annoyance and impatience:</p> <ul style="list-style-type: none"> <li>• “It’s kind of annoying how it pops up.”</li> <li>• “I’m annoyed because they interrupt my watching time.”</li> </ul> <p>Qualified responses:</p> <ul style="list-style-type: none"> <li>• “Sometimes, if they make it like, entertaining to watch, it’s fine. Otherwise, sometimes I think it’s annoying.”</li> <li>• “Usually, a mixture between annoyed and humored. Usually, I skip it before I can even tell what it is for.”</li> </ul> <p>Length of time:</p> <ul style="list-style-type: none"> <li>• “Sometimes, it’s annoying because there’s so many in a row and you’re like, well, there are more advertisements than the thing I’m actually watching, but I don’t really feel annoyed.”</li> <li>• “I think they’re pretty OK, unless they’re obnoxious and they play over and over again.”</li> </ul> <p>Impatience:</p> <ul style="list-style-type: none"> <li>• “Well, it depends on how long they’re on. If it’s like one commercial on the show, then back on, I’m good. If it’s like five commercials and they’re all different ones, I’m a little less okay, but I am still okay. But, if it’s the same commercial, like the whole break, I’m like bro, are you kidding me? It’s like they want to get their advertisement out so much that they’re willing to pretty much break you, to make somebody go crazy to advertise their new thing.”</li> <li>• “Well, sometimes I kind of want it to be done to get back to like what I’m watching or doing.”</li> </ul> <p>Hunger:</p> <ul style="list-style-type: none"> <li>• “It made me kind of hungry”</li> <li>• “Annoying, because then I’m hungry, then I want something.”</li> <li>• “I kind of wanted to buy it, but I don’t really like cereal. So, I don’t know why.”</li> </ul>
Actions related to food marketing exposure	<p>Ad warning:</p> <p>Negative responses:</p> <ul style="list-style-type: none"> <li>• “I think I would know because on the commercials, they give huge hints that you can see, sometimes grease in certain scenes, in certain shots. And my mom told me that grease isn’t healthy for you. I can tell grease because of its shininess. Legos have almost the same shininess to them.”</li> <li>• “I think it’s pretty clear.”</li> </ul> <p>Helpful responses:</p> <ul style="list-style-type: none"> <li>• “Well, a lot of people probably won’t recognize that it’s unhealthy so I think the warning would help.”</li> <li>• “An ad warning would help.”</li> </ul>

advertising meant. Notably, several children indicated that they were willing to watch food advertisements if they found the ads funny, interesting, or new. Several children indicated that they were willing to consume advertised foods if they liked the flavors or taste, regardless of knowing whether the foods were healthy or not. These findings suggest that children can self-identify direct food ads, and they can articulate the intent of food advertising; however, they are still receptive to the ads because of engaging content (e.g., liking ads as entertainment, watching ads even when given the chance to skip) and the food items marketed (e.g., liking the taste of foods).

When asked about their utilization of the skip ad button, all children knew what the authors were asking about. If the ads were entertaining, interesting, or funny, children were more likely to watch them, regardless of wanting to get to their content. This supports that children can identify ads but are still receptive to them.<sup>13,14,25</sup> If children are purposefully not skipping ads when given a choice, this suggests that they value the ads as part of their viewing experience. It could also

potentially mean that children are at increased risk of being exposed to ads that may not be age appropriate and may increase the risk associated with clicking on ads. To the authors’ knowledge, there have been no studies evaluating the effect of children using the skip ad button on a diet or health outcome. More research is needed to understand the factors that predict whether a child will hit the skip ad button or watch the content and the potential health impacts.

The authors found that children often reported a desire to consume the foods marketed to them, and indeed, this is what food advertisements are designed to do.<sup>36</sup> Most ads identified in this study appeared to be classic direct ads, compared with ones found embedded in content or in social media influencer videos. There were very few references to influencer ads across children’s responses; therefore, it is unknown how well this age group can identify and respond to food marketing in that context. Children may be susceptible to this type of marketing because evidence suggests that children perceive influencers as being trustworthy and relatable<sup>37</sup> and that children’s ability to critically reflect on content

is limited.<sup>38</sup> Recently, a meta-analysis of children aged 8–11 years found that under experimental conditions, the use of celebrities and social media influencers increased consumption of highly processed foods compared with non-food marketing.<sup>39</sup> Future studies could involve providing children with examples of both direct ads and embedded ads to better understand preadolescents' perceptions of food advertising. Studies could also obtain more information from the parents to identify any differences between parent and child perspectives about food marketing on newer media platforms.

More research is also needed to determine the effectiveness of interventions that may be developed to reduce advertisement exposure or risk in children such as supporting parents to have conversations with their children about media and food marketing, reducing screentime, promoting the use of pop-up blockers, and providing funding to help people pay to filter out ads. Children claim to be aware of advertising but are still receptive to the ads. Thus, media literacy to increase awareness of advertising and advertising intent may not be effective because these ads are still captivating to children. More research could also be conducted to determine whether ad warnings may be effective; however, this analysis suggests that ad warnings to disclose marketing may have limited effectiveness among preadolescents, consistent with previous studies.<sup>40,41</sup> In an RCT of children aged 9–11 years, authors found that regardless of ad disclosure, social media influencer marketing increases immediate intake of the advertised snack compared with an alternative.<sup>40</sup> Overall, children in this age group can identify direct food ads and can articulate the intent of food advertising; however, they are still receptive to the ads.

Qualitative studies help to increase understanding of the experiences and perspectives of children from their own voices and, specifically in this case, their food marketing exposure and interactions with marketing through online media. This transparency can help researchers have a deeper understanding of how food marketing affects children's eating behaviors and help identify strategies for promoting healthier habits that may extend from childhood to adulthood.

### Limitations

Study limitations include a small sample size and a potential for social desirability bias. There is also the potential for researcher bias, where the researcher's own views or experiences may influence the interpretation of the data; however, the authors used peer review from coauthors and triangulation to minimize this potential bias. The study sample reflected a largely non-Hispanic White population that was mostly highly educated.

These results may not be generalizable to the entire U.S. population, and more research is needed in diverse populations. In addition, although these children aged 9–11 years were able to identify and provide examples of direct food advertisements, it is unclear whether they are able to identify all types of food advertising. Despite these limitations, this study helps to provide information about children's perspectives of being advertised to for unhealthy foods across newer media platforms from their own lived experiences.

### CONCLUSIONS

In this study, the authors examined children's self-reported identification of food marketing, attitudes about food marketing, and actions related to food marketing exposure. The authors show that these children aged 9–11 years have a general understanding of direct food marketing and its intent. However, many children are still receptive to food marketing when it is entertaining, interesting, or new. These findings may facilitate new interventions focused on supporting parents to talk to their children about digital media and food advertising; however, media literacy to increase awareness of advertising may not be effective because the advertisements are still captivating to children. More research is needed on children's perceptions of embedded ads, such as food marketing through social media influencers, and the potential effects on children's health in a larger, more diverse sample.

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### CREDIT AUTHOR STATEMENT

Jennifer E. Carroll: Methodology, Investigation, Funding acquisition, Data curation, Software, Formal analysis, Writing – original draft, Writing – review & editing. Jennifer A. Emond: Conceptualization, Validation, Writing – review & editing. Linda L. Griffin: Conceptualization, Methodology, Validation, Writing – review & editing. Elizabeth R. Bertone-Johnson: Conceptualization, Methodology, Writing – review & editing. Nicole A. VanKim: Methodology, Validation, Writing – review & editing. Susan R.

Surgeon: Conceptualization, Supervision, Writing – review & editing.

## SUPPLEMENTARY MATERIALS

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## REFERENCES

- Cheung PC, Cunningham SA, Narayan KM, Kramer MR. Childhood obesity incidence in the United States: a systematic review [published correction appears in *Child Obes*. 2016;12(3):226]. *Child Obes*. 2016;12(1):1–11. <https://doi.org/10.1089/chi.2015.0055>.
- Birch LL. Development of food acceptance patterns in the first years of life. *Proc Nutr Soc*. 1998;57(4):617–624. <https://doi.org/10.1079/pns19980090>.
- Boyland EJ, Nolan S, Kelly B, et al. Advertising as a cue to consume: a systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults. *Am J Clin Nutr*. 2016;103(2):519–533. <https://doi.org/10.3945/ajcn.115.120022>.
- Carroll JE, Price G, Longacre MR, et al. Associations between advertisement-supported media exposure and dietary quality among preschool-age children. *Appetite*. 2021;166:105465. <https://doi.org/10.1016/j.appet.2021.105465>.
- Emond JA, Longacre MR, Drake KM, et al. Exposure to child-directed TV advertising and preschoolers' intake of advertised cereals. *Am J Prev Med*. 2019;56(2):e35–e43. <https://doi.org/10.1016/j.amepre.2018.09.015>.
- Emond JA, Longacre MR, Drake KM, et al. Influence of child-targeted fast food TV advertising exposure on fast food intake: a longitudinal study of preschool-age children. *Appetite*. 2019;140:134–141. <https://doi.org/10.1016/j.appet.2019.05.012>.
- L Harris J, Webb V, J Sacco S, L Pomeranz J. Marketing to children in supermarkets: an opportunity for public policy to improve children's diets. *Int J Environ Res Public Health*. 2020;17(4):1284. <https://doi.org/10.3390/ijerph17041284>.
- Harris JL, Fleming-Milici F, Kibwana-Jaff A, Phaneuf L. Sugary drink FACTS; 2020. Sugary Drink Advertising to Youth: Continued Barrier to Public Health Progress. Hartford, CT: UConn Rudd Center for Food Policy & Obesity. [https://www.sugarydrinkfacts.org/resources/Sugary%20Drink%20FACTS%202020/Sugary\\_Drink\\_FACTS\\_Full%20Report\\_final.pdf](https://www.sugarydrinkfacts.org/resources/Sugary%20Drink%20FACTS%202020/Sugary_Drink_FACTS_Full%20Report_final.pdf). Published June 2020. Accessed January 2024.
- Boyland EJ, Harrold JA, Dovey TM, et al. Food choice and overconsumption: effect of a premium sports celebrity endorser. *J Pediatr*. 2013;163(2):339–343. <https://doi.org/10.1016/j.jpeds.2013.01.059>.
- Andreyeva T, Kelly IR, Harris JL. Exposure to food advertising on television: associations with children's fast food and soft drink consumption and obesity. *Econ Hum Biol*. 2011;9(3):221–233. <https://doi.org/10.1016/j.ehb.2011.02.004>.
- Dalton MA, Longacre MR, Drake KM, et al. Child-targeted fast-food television advertising exposure is linked with fast-food intake among pre-school children. *Public Health Nutr*. 2017;20(9):1548–1556. <https://doi.org/10.1017/S1368980017000520>.
- Longacre MR, Drake KM, Titus LJ, et al. Child-targeted TV advertising and preschoolers' consumption of high-sugar breakfast cereals. *Appetite*. 2017;108:295–302. <https://doi.org/10.1016/j.appet.2016.10.014>.
- Graff S, Kunkel D, Mermin SE. Government can regulate food advertising to children because cognitive research shows that it is inherently misleading. *Health Aff (Millwood)*. 2012;31(2):392–398. <https://doi.org/10.1377/hlthaff.2011.0609>.
- Carter OB, Patterson LJ, Donovan RJ, Ewing MT, Roberts CM. Children's understanding of the selling versus persuasive intent of junk food advertising: implications for regulation. *Soc Sci Med*. 2011;72(6):962–968. <https://doi.org/10.1016/j.socscimed.2011.01.018>.
- Packer J, Croker H, Goddings AL, et al. Advertising and young people's critical reasoning abilities: systematic review and meta-analysis. *Pediatrics*. 2022;150(6):e2022057780. <https://doi.org/10.1542/peds.2022-057780>.
- Calvert SL. Children as consumers: advertising and marketing. *Future Child*. 2008;18(1):205–234. <https://doi.org/10.1353/foc.0.0001>.
- Tarabashkina L, Qvester P, Crouch R. Food advertising, children's food choices and obesity: interplay of cognitive defences and product evaluation: an experimental study. *Int J Obes (Lond)*. 2016;40(4):581–586. <https://doi.org/10.1038/ijo.2015.234>.
- Ali M, Blades M, Oates C, Blumberg F. Young children's ability to recognize advertisements in web page designs. *Br J Dev Psychol*. 2009;27(Pt 1):71–83. <https://doi.org/10.1348/026151008x388378>.
- Rideout V, Peebles A, Mann S, Robb M. *The Common Sense census: media use by tweens and teens*. New York, NY: Common Sense; 2021. [https://www.common SenseMedia.org/sites/default/files/research/report/8-18-census-integrated-report-final-web\\_0.pdf](https://www.common SenseMedia.org/sites/default/files/research/report/8-18-census-integrated-report-final-web_0.pdf).
- Harris JL, Fleming-Milici F, Phaneuf L, et al. Fast food advertising: billions in spending, continued high exposure by youth. Hartford, CT: UConn Rudd Center for Food Policy & Obesity. <https://media.rudd-center.uconn.edu/PDFs/FACTS2021.pdf>. Published 2021. Accessed January 2024.
- Bragg MA, Eby M, Arshonsky J, Bragg A, Ogedegbe G. Comparison of online marketing techniques on food and beverage companies' websites in six countries. *Global Health*. 2017;13(1):79. <https://doi.org/10.1186/s12992-017-0303-z>.
- Emond JA, Fleming-Milici F, McCarthy J, et al. Unhealthy food marketing on commercial educational Websites: remote learning and gaps in regulation. *Am J Prev Med*. 2021;60(4):587–591. <https://doi.org/10.1016/j.amepre.2020.10.008>.
- Bragg M, Lutfeali S, Greene T, Osterman J, Dalton M. How food marketing on Instagram shapes adolescents' food preferences: online randomized trial. *J Med Internet Res*. 2021;23(10):e28689. <https://doi.org/10.2196/28689>.
- Brooks R, Christidis R, Carah N, Kelly B, Martino F, Backholer K. Turning users into 'unofficial brand ambassadors': marketing of unhealthy food and non-alcoholic beverages on TikTok. *BMJ Glob Health*. 2022;7(6):e009112. <https://doi.org/10.1136/bmjgh-2022-009112>.
- Lutfeali S, Ward T, Greene T, et al. Understanding the extent of adolescents' willingness to engage with food and beverage companies' Instagram accounts: experimental survey study. *JMIR Public Health Surveill*. 2020;6(4):e20336. <https://doi.org/10.2196/20336>.
- Merriam SB, Tisdell EJ. *Qualitative Research: A Guide to Design and Implementation*. 4th ed. San Francisco, CA: Jossey-Bass, 2016.
- Rossman GB, Rallis SF. *Learning in the Field: an Introduction to Qualitative Research*. 3rd ed. Thousand Oaks, CA: Sage Publications, 2017.
- Zoom Video Communications Inc. Zoom security guide. San Jose, CA: Zoom Video Communications Inc. <https://d24cgw3uvb9a9h.cloudfront.net/static/81625/doc/Zoom-Security-White-Paper.pdf>. Published July 2016. Accessed January 2024.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research Electronic Data Capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377–381. <https://doi.org/10.1016/j.jbi.2008.08.010>.
- Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform*. 2019;95:103208. <https://doi.org/10.1016/j.jbi.2019.103208>.
- International QSR Pty Ltd. NVivo. <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>. Updated July 2022. Accessed May 2023.



32. R Core Team. R: a language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing; Published 2020. <https://www.R-project.org/>.
33. Slade J. Ruffles Made a “Fresh” Pair of Sneakers... and Unboxing a Second Sneaker for the GOAT. *YouTube* Published 2018. <https://www.youtube.com/watch?v=8e7GvLYIFQg>. Accessed May 1, 2023.
34. Slade J. This TWIX x The Shoe Surgeon Sneaker Has A Secret. *YouTube* Published 2020. <https://www.youtube.com/watch?v=Tv5kTangIX4>. Accessed May 1, 2023.
35. Monteiro CA, Cannon G, Levy RB, et al. Ultra-processed foods: what they are and how to identify them. *Public Health Nutr.* 2019;22(5):936–941. <https://doi.org/10.1017/S1368980018003762>.
36. Alruwaily A, Mangold C, Greene T, et al. Child social media influencers and unhealthy food product placement. *Pediatrics.* 2020;146(5):e20194057. <https://doi.org/10.1542/peds.2019-4057>.
37. Schouten AP, Janssen L, Verspaget M. Celebrity vs. influencer endorsements in advertising: the role of identification, credibility, and Product-Endorser fit. *Int J Advert.* 2020;39(2):258–281. <https://doi.org/10.1080/02650487.2019.1634898>.
38. Hudders L, Lou C. The rosy world of influencer marketing? Its bright and dark sides, and future research recommendations. *Int J Advert.* 2023;42(1):151–161. <https://doi.org/10.1080/02650487.2022.2137318>.
39. Packer J, Russell SJ, Siovolgyi G, et al. The impact on dietary outcomes of celebrities and influencers in marketing unhealthy foods to children: a systematic review and meta-analysis. *Nutrients.* 2022;14(3):434. <https://doi.org/10.3390/nu14030434>.
40. Coates AE, Hardman CA, Halford JCG, Christiansen P, Boyland EJ. The effect of influencer marketing of food and a “protective” advertising disclosure on children’s food intake. *Pediatr Obes.* 2019;14(10):e12540. <https://doi.org/10.1111/ijpo.12540>.
41. Lacoste-Badie S, Minvielle M, Droulers O. Attention to food health warnings in children’s advertising: a French perspective. *Public Health.* 2019;173:69–74. <https://doi.org/10.1016/j.puhe.2019.05.012>.