

What's on YouTube? A Case Study on Food and Beverage Advertising in Videos Targeted at Children on Social Media

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Abstract

Background: Unhealthy food marketing to children is a key risk factor for childhood obesity. Online video platforms have surpassed television as the primary choice for screen viewing among children but the extent of food marketing through such media is relatively unknown. We aimed to examine food and beverage advertisements (ads) encountered in YouTube videos targeting children in Malaysia.

Methods: The social media analytics site SocialBlade.com was used to identify the most popular YouTube videos ($n=250$) targeting children. Ads encountered while viewing these videos were recorded and analyzed for type of product promoted and ad format (video vs. overlay). Food and beverage ads were further coded based on food category and persuasive marketing techniques used.

Results: In total 187 ads were encountered in sampled videos. Food and beverage ads were the most common at 38% ($n=71$), among which 56.3% ($n=40$) promoted noncore foods. Ads for noncore foods were more commonly delivered as video rather than overlay ads. Among ads promoting noncore foods, the most commonly employed persuasive marketing techniques found were taste appeal (42.3%), uniqueness/novelty (32.4%), the use of animation (22.5%), fun appeal (22.5%), use of promotional characters (15.5%), price (12.7%), and health and nutrition benefits (8.5%).

Conclusions: Similar to television, unhealthy food ads predominate in content aimed toward children on YouTube. Policies regulating food marketing to children need to be extended to cover online content in line with a rapidly-evolving digital media environment. Service providers of social media can play a part in limiting unhealthy food advertising to children.

Keywords: advertising; children; food marketing; obesity; social media; YouTube

Introduction

Childhood obesity is a crucial public health problem that has seen a dramatic rise in worldwide prevalence over the past three decades.¹⁻³ About two-thirds of obese children eventually become obese adults,⁴ carrying with them an increased risk of chronic disease in later life.⁵⁻⁸ Obesity prevention efforts aimed at children are therefore considered a high priority, with the potential for massive savings in future healthcare expenditure.⁹ An important environmental factor (amongst other genetic, behavioral, and dietary components) contributory to the multifactorial problem of childhood obesity¹⁰ is the exposure of children

to food and beverage advertising on television and other media, which has been shown to influence children's food preferences, purchases, and consumption.^{11,12} The regulation and restriction of food marketing to children, therefore, is a highly promising avenue for intervention.¹³

The bulk of existing research examining food marketing targeted at children has focused on traditional media, specifically television advertising—the extent and nature of which has been investigated extensively in many countries¹⁴⁻²⁸—with overwhelming evidence that unhealthy foods tend to be promoted most and multiple persuasive marketing techniques are often implemented.^{12,29} In comparison, only a few studies explored food marketing to

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children in new media (mainly on children’s and food brand websites).^{30–34} This is despite industry data showing diminishing marketing expenditure for traditional media (television, print, and radio),³⁵ whereas digital or new media marketing expenditure saw a three-digit percentage growth from 2005 to 2009.³⁶

The “digital age” alone has also seen a shift from “traditional” websites—usually accessed by typing an address into a web browser or clicking a specific link—toward integrated social media platforms that are accessible across the entire gamut of devices from desktop computers to mobile phones, tablets, and even smart watches. It was recently observed that television is no longer the primary choice for screen viewing among children,^{37,38} having been surpassed by online viewing platforms, among which YouTube is dominant with over 1 billion unique users monthly.³⁹ Since its inception only a little over a dozen years ago, YouTube has become a dominant source of media consumption among children in many developed countries as shown by a contemporary survey in the United Kingdom, where half of children aged 3–4 and more than eight in ten aged 5–15 use YouTube.⁴⁰

Watching videos online is now normative behavior among toddlers³⁷ and parents frequently make use of touchscreens as “digital pacifiers” or “shut-up toys” to keep children occupied and calm them down in public places.^{41–43} In view of the rapidly rising popularity of this social media platform among children, we undertook a case study to examine food and beverage advertisements (ads) encountered in YouTube videos targeting Malaysian children.

Methods

The flow of data collection for this study is summarized in Figure 1.

Sampling of Videos

YouTube categorizes its videos into several main categories such as “Auto & Vehicles,” “Education,” “Entertainment,” “How-To & Style,” “Music,” “Travel,” and so on. However, a “Children” or “Kids” category was noticeably absent. In view of this, nonproprietary data were obtained from SocialBlade.com, a social media analytics website independent of YouTube, which tracks and collects detailed statistics on YouTube channels such as number of views or followers. The top 25 most popular child-centric YouTube channels (Appendix 1) were identified using the “Kids” tag as a filter and ranked by total lifetime views on SocialBlade.com. This list is publicly available on <https://socialblade.com/youtube/top/tag/kids/videoviews>, although the rankings are of course subject to change over time.

The top 10 most-viewed videos for each of the 25 channels were then selected to be included in the sample ($n=250$). This was done by loading a list of all videos uploaded by a particular channel, and then using the in-built “Sort” button to rank the videos by number of views. At the time of recording, the lifetime view counts of all videos totaled 46.8 billion views.

Recording

All shortlisted videos were viewed on the YouTube website (www.youtube.com) using the Google Chrome browser

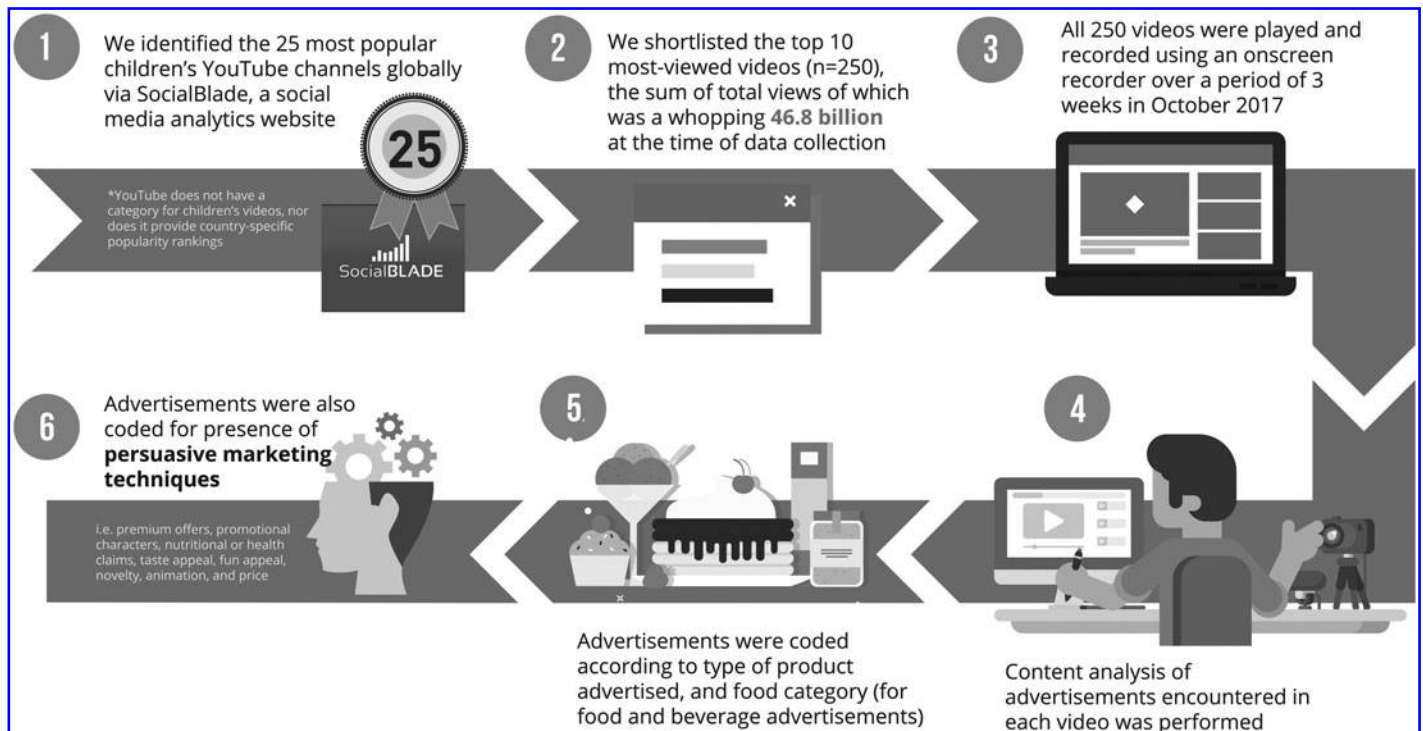


Figure 1. Flow of data collection for this study.

(Google, Inc., California, USA). To circumvent the use of cookies (small files stored on a web browser that tracks and records users' activities and browsing habits) and prevent targeted advertising, the browser was set to "incognito" mode, and a new window was opened each time a video was viewed.⁴⁴ While the videos and ads played within the browser they were recorded with Apowersoft Screen Recorder Pro (Apowersoft Ltd., Hong Kong). All videos were recorded over a period of 3 weeks in October 2017, totaling 54 hours and 35 minutes. Recording was conducted in Kuala Lumpur, Malaysia, which was the site for this study.

YouTube Ad Formats

At the time of recording, YouTube has two main types of in-video ad formats: (a) video ads that are either skippable or non-skippable, and (b) semi-transparent overlay ads that appear on the lower 20% portion of the video—both of which were included in our sample.⁴⁵ Both video and overlay ads can appear at any point in a video, although video ads commonly appear at the beginning. Overlay ads are generally either text-only, static images, or have very little movement and animation to them. They are also less expensive to place than other ad formats.⁴⁶

Provided they meet certain "video monetization criteria," the video owner can choose whether or not to have ads present in their videos, and their format and frequency (but not content or advertiser); for this they will receive monetary payouts accordingly. YouTube also displays ads elsewhere on the desktop version of the site (usually to the right of the video player, above the videos suggestion list), however, these were excluded from the present study as they are not located within the boundaries of the video player (*i.e.*, not in-video ads).

Data Coding and Analysis

All ads encountered were categorized based on the type of product advertised. Food and beverage ads were coded according to a standard list of 36 food codes¹⁴ (Appendix 2), with modifications made for better relevance to the Malaysian food supply as per a previous study focusing on television ads.⁴⁷ Each food code was further assigned to one of three food categories (core, noncore, and miscellaneous foods). Core foods are nutrient dense and low in discretionary energy and can be recommended to be consumed daily, while noncore foods are high in undesirable nutrients such as high fat, refined sugars, and salt.¹⁴ However, since the number of ads promoting core foods was very low ($n=2$), they were analyzed in combination with the miscellaneous foods category.

The content of food and beverage ads were further analyzed to determine prevalence of the most frequently reported persuasive marketing techniques found to promote food to children on television, as identified by a published systematic review on the subject.^{29,48} Two researchers (L.T. and S.H.N.) simultaneously performed the coding. Interrater reliability was calculated based on the method used by Zuppa et al.⁴⁹ and recorded as 94% for food

category assignment and 100% for identification of persuasive marketing techniques. Disagreement on food category was resolved by discussion with a senior investigator (T.K.) until a consensus was reached. Chi-square testing was used to compare ad formats used to promote noncore foods and core and miscellaneous foods.

Results

A total of 187 ads were encountered while viewing videos in the sample, of which 108 were overlay ads, 74 were skippable video ads, and 5 were non-skippable video ads. Shortlisted videos that did not show any ads were nonetheless included for analysis, to ensure a fair representation of the frequency of food and beverage ads found within the 250 most popular children's videos. Although content analysis of the videos is beyond the scope of this article, both coders agreed that all videos viewed were unquestionably child-centric (mostly toy unboxing videos, nursery rhymes, and children's songs), and were unlikely to be voluntarily watched by the average teen or adult viewer.

Twelve product types were promoted in ads encountered. Food and beverage ads were most common ($n=71$, 38%), followed by financial services ($n=33$, 17.6%) and technology/web services ($n=22$, 11.8%). On average we encountered 1.3 ads promoting food and beverage products for every hour of videos viewed (Table 1).

Among the food and beverage ads, there were more ads for noncore foods ($n=40$, 56.3%) than both core and miscellaneous foods combined ($n=31$, 43.7%). The most common food type advertised, however, was vitamin/mineral or other dietary supplements ($n=20$, 28.2%)—belonging to the miscellaneous food category, followed by fast food ($n=15$, 21.1%) and chocolate and candy ($n=12$, 16.9%)—both of which fall under the noncore food category.

Ads for noncore foods were much more commonly delivered as video rather than overlay ads (82.5% vs. 17.5%). The number of noncore foods promoted via video ads was also significantly higher (Table 2) compared to core and miscellaneous foods ($\chi^2=37.05$, $p<0.0001$). Among ads promoting noncore foods, the most commonly employed persuasive marketing techniques (Table 3⁵⁰) found were taste appeal (42.3%), marketing a product as being unique or new (32.4%), the use of animation (22.5%), fun appeal (22.5%), use of promotional characters (15.5%), price (12.7%), and health and nutrition benefits (8.5%).

Discussion

To our knowledge, this is the first case study to examine food and beverage advertising encountered in YouTube videos targeted at children. In a recent report the World Health Organization Europe⁵¹ expressed concern regarding the marketing of unhealthy foods in digital and social media, which not only amplifies advertising in traditional media but is also very poorly regulated and monitored. Generally, the inherent networking nature and literate environment of popular social media sites such as Facebook,

Table 1. Product Types and Food Categories

Category	Frequency (%)	Rate (ads/h)
Product type (n=187)		
Food and beverage	71 (38.0)	1.30
Financial services	33 (17.6)	0.60
Technology/web services	22 (11.8)	0.40
Entertainment and travel	16 (8.6)	0.29
Household appliances	15 (8.0)	0.27
Health and medicinal	11 (5.9)	0.20
Clothing	5 (2.7)	0.09
Education	4 (2.1)	0.07
Toys	4 (2.1)	0.07
Baby products	3 (1.6)	0.05
Property	2 (1.1)	0.04
Cleaning products	1 (0.5)	0.02
Food and beverage (n=71)		
Noncore foods ^a	40 (56.3)	0.73
Fast food (not only healthier options advertised)	15 (21.1)	0.27
Chocolate and candy	12 (16.9)	0.22
Sweet breads/cakes/muffins/buns, sweet glutinous rice balls/cakes, high fat savory biscuits, pies, and pastries, sweet sticky rice/rice pudding	6 (8.5)	0.11
Flavored or dairy products with added sugar and alternatives	3 (4.2)	0.05
Ice cream, iced confection, and desserts	3 (4.2)	0.05
Sugar sweetened drinks	1 (1.4)	0.02
Core ^b and Miscellaneous ^c foods	31 (43.7)	0.57
Low sugar and high fiber breakfast cereals (<20 g sugar/100 g and >5 g dietary fiber/100 g)	1 (1.4)	0.02
Fruits and fruit products without added fats, sugars, or salt	1 (1.4)	0.02
Vitamin/mineral or other dietary supplements	20 (28.2)	0.37
Baby and toddler milk formulae	9 (12.7)	0.16

Food and beverage categories with no ads were excluded from the table. See Appendix 2 for the full list.

^aFood that is relatively high in undesirable nutrients such as high fat, refined sugars, and salt.

^bFood that is recommended to be consumed daily to meet nutrient requirements.

^cFood that is added to flavor meals (e.g., recipe additions); supplements; milk formula for baby and toddlers; tea and coffee (plain); fast food (with no noncore foods); or local restaurant and supermarkets.

Table 2. Ad Formats

Category	Video ads (%)	Overlay ads (%)
Food and beverage (n=71)		
Noncore foods	33 (82.5)	7 (17.5)
Fast food (not only healthier options advertised)	8 (53.3)	7 (46.7)
Chocolate and candy	12 (100)	0 (0.0)
Sweet breads/cakes/muffins/buns, sweet glutinous rice balls/cakes, high fat savory biscuits, pies, and pastries, sweet sticky rice/rice pudding	6 (100)	0 (0.0)
Flavored or dairy products with added sugar and alternatives	3 (100)	0 (0.0)
Ice cream, iced confection, and desserts	3 (100)	0 (0.0)
Sugar sweetened drinks	1 (100)	0 (0.0)
Core and Miscellaneous foods	3 (9.7)	28 (90.3)
Low sugar and high fiber breakfast cereals (<20 g sugar/100 g and >5 g dietary fiber/100 g)	0 (0.0)	1 (100)
Fruits and fruit products without added fats, sugars, or salt	1 (100)	0 (0.0)
Vitamin/mineral or other dietary supplements	0 (0.0)	20 (100.0)
Baby and toddler milk formulae	2 (22.2)	7 (77.8)

Twitter, Tumblr, and Instagram effectively precludes very young children. YouTube, however, is an obvious exception in this group with its largely visual content and simple user interface that facilitates easy and immediate access for infants and preschoolers who do not need to open a web browser to find their favorite sites.^{41,52} Therefore, the predominance of unhealthy food marketing on YouTube as found in this study is particularly worrying considering the affinity of very young children toward the platform, as they are least adept at recognizing persuasive intent when exposed to advertising and hence the most vulnerable group to marketing techniques or brand imprinting.^{53,54}

We found that similar to television, ads for unhealthy foods predominate among the top child-centric YouTube videos, which have collectively been viewed 46.8 billion times around the world. The rate of noncore food advertising on YouTube in this case study was found to be lower than that of television (0.73 vs. 2.73⁴⁷ ads per hour) in Malaysia and other countries in the Asia Pacific region.¹⁵ Despite this, we argue that YouTube may prove to be a much more potent marketing medium than television for several reasons.

Unlike on broadcast television where there are specific timeslots for children's programs, videos on YouTube are easily accessible and available at any time. The platform

Table 3. Persuasive Marketing Techniques

Persuasive marketing technique	Description	Example	Prevalence in ads, % ^a		
			Noncore food	Core and misc. foods	Total
Taste appeal	Description/depiction of food product as tasting or smelling good ⁴⁸	“Fresh, whole fish fillet - Deliciously crispy! Spicy green curry sauce...” (burger ad from a famous fast food chain)	42.3	8.5	50.7
Unique/new	Description/depiction of food product as “new,” “different,” “modern,” or “in-fashion,” or similar word ⁴⁸	“The New... [ice-cream brand] Classically Mint. Delicious mint ice cream with crunchy cookie crumbs... So indulge, the world can wait.” (ice-cream ad)	32.4	0.0	32.4
Animation	A computer-generated imaging technique that builds narrative on three-dimensional characters. ⁵⁰	Animated sequence showing a chocolate bar and a cookie becoming best friends and spending time together doing fun things (chocolate ad)	22.5	7.0	29.6
Fun appeal	Both nonverbal displays of fun and happiness (e.g., smiling or playing) or use of the words “fun,” “happiness,” or “pleasure” ²⁹	Person waiting at bus stop, upon biting into chocolate bar suddenly has colorfully dressed characters dancing around him, twirling him around with confetti raining down (chocolate ad)	22.5	4.2	26.8
Promotional characters	Includes brand identification characters, licensed characters, unlicensed characters, and celebrities or popular personalities, including sports persons, health professionals, or scientists ²⁹	Ad for sweetened biscuits hosted and narrated by two local Malaysian and Indonesian celebrities (biscuit ad)	15.5	5.6	21.1
Price advantages	Description/depiction of food product as “economical” or “value for money” ²⁹	Fast food chain advertising their “Bucket Berbaloi” (or “Value Bucket”), which is priced “from only RM26.90 for 2–3 pax” (fried chicken ad)	12.7	1.4	14.1
Health and nutrition benefits	General statement about health or nutritive benefits of food product to user ⁴⁸	“Introducing a breakthrough in pediatric nutrition... Research shows that MFGM (milk fat globule membrane) together with DHA (an omega-3 fatty acid) helps support mental and emotional development.” (formula milk ad)	8.5	45.1	53.5
Premium offers	Food advertisement depicts a premium offer with purchase of the food product, for example, competition, giveaway (such as a toy or tickets to a venue or show), rebate, or voucher ⁴⁸	“Win up to RM50 worth of vouchers...” (cereal ad)	0.0	1.4	1.4

^aPercentages do not amount to 100% as many ads apply more than one technique.

also has the potential to maintain children’s attention for longer periods as they are now able to choose exactly which videos they want to watch—for as many times as they like. In addition, ads on social media are further tailored to one’s personal interests, facilitated by browser cookies that continuously collect information such as visited websites or products viewed on online stores. Such behavioral or personalized marketing (which cannot be done via traditional media) has greater persuasive power, specifies audiences with precision, and has the ability to target the most vulnerable population groups.⁵¹

Due to the availability of different ad formats (video vs. overlay) within the same platform, this case study was also

able to demonstrate that unhealthy foods were being promoted more aggressively to children compared to other foods. Noncore foods were more frequently advertised via video ads, which are more prominent and applied more persuasive marketing techniques per ad (data not shown) than overlay ads. Being video, these ads need to be filmed and edited, with animation often involved, and are thus far more expensive to make and place than the overlay ads (which are usually just text or static images).^{46,55}

We also observed in our study that the most frequent persuasive marketing techniques detected among ads promoting noncore foods were taste appeal and the depiction of a food product as being unique, new, or in-fashion. A

comparable study documenting persuasive marketing techniques used in television ads found similar results with food taste, physical qualities, and novelty reported as the top three most common techniques.²¹ While some countries do restrict the use of premium offers and promotional characters to promote food to children,⁵⁶ promotional appeals such as taste and uniqueness/novelty are not currently subject to regulatory limitations in any country.²⁹

Discourse on limiting the extent of unhealthy food marketing to children is usually focused on two main avenues—statutory regulation and industry (advertisers) self-regulation. In this rapidly changing media environment, however, current legislation and policies with regard to the marketing of unhealthy food to children are not consistent or rigorous, and clearly lag behind children's adoption of online and social media, while self-regulatory codes often have a narrow scope, weak criteria, and limited government oversight.⁵¹ A possible explanation for slow progress in this area may be that digital media marketing expenditure for food and beverage companies still remains lower in absolute spending compared to television advertising.³⁵ Even so, it should be stressed that advertising on new media leverages upon targeted behavioral marketing and is relatively cheaper⁵⁷ compared to traditional advertising placement. Therefore comparisons of absolute ad expenditures between broadcast and digital channels poorly reflect the relative measures of their actual extent and reach.

Perhaps, a third mechanism should be conceptualized to limit unhealthy food marketing to children in digital media—in the form of resolute restrictions put in place by providers of the service or platform. The YouTube Kids app (Google, Inc., California, USA) sets a real-life precedent for a complete ban of food marketing in a media environment primarily aimed at children. It is a separate entity from the regular YouTube mobile app, and uses filters powered by algorithms to select family-friendly videos from YouTube. It also allows certain parental controls and settings such as setting a timer to limit how much time a child spends on the app. Although sponsored commercials still appear in videos viewed on the app, its creators' decision to explicitly ban any ads related to consumable food and drinks regardless of nutritional content⁵⁸ is commendable.

However, usage of the app amongst children is dependent on their parents' awareness of it, and is limited to mobile devices only (according to a U.K. study, approximately half the surveyed children aged 3–4 (48%) and a quarter (25%) aged 5–7 were solely using the YouTube Kids app).⁴⁰ Children who continue to access videos via desktop or mobile browsers in addition to the regular YouTube app on a handheld device are still exposed to unconstrained food marketing, which warrants further attention on the exposure of unhealthy food marketing on YouTube through other browsing methods.

If children have the right to participate in digital media, their health and privacy should be protected and not economically exploited.⁵¹ Therefore, in a rights-based approach to addressing the marketing of unhealthy food to

children, parents should be supported in upholding these rights by both governments and businesses especially the technology conglomerates behind many of today's social media services. Considering the predominance of unhealthy food marketing in digital media, relevant stakeholders need to work toward establishing a balance between profits and their corporate, ethical, and social responsibilities in relation to food marketing to children.

A limitation inherent to this type of study could be the influence of “cookies” on ads appearing within the sampled videos. However, we mitigated any potential bias by using the “incognito” browser mode during our recording sessions. Thus, the “cookie-free” data collected on ads in our study were assessed to be the minimum extent of noncore food and beverage marketing within child-oriented videos on YouTube. We anticipate the exposure may be even more prevalent in actuality when cookie-facilitated targeted marketing is used by food and beverage advertisers to track children's online habits.

Ads shown on YouTube may also differ by geographical locations as detected by the IP address of the user. As videos were viewed from Malaysia, ads encountered could have been country-specific. Hence, our findings may not necessarily be representative of all regions. In shortlisting the most popular child-centric videos for our sample, we were only able to use global rankings as country-level data on the most popular videos were not freely available. Due to YouTube's minimum sign-up age requirement of 13 years, detailed demographic data for younger users are unlikely to be derived from the operational data collected by the service provider, thereby posing a further challenge in determining children's absolute exposures to food marketing on the platform.

Other recognized challenges include limited access to data and intelligence analytics on marketing on social media (often considered “commercially privileged” information by service providers of social media platforms), and ethical barriers in gaining access to private social media accounts or children's devices.⁵¹ Future research in this area may be thus limited to observational experiments involving, for example, the emulation of children's browsing habits to account for targeted advertising.

Conclusion

Our case study analysis of ads encountered in YouTube videos targeted at children revealed that food and beverage ads appeared most frequently (reflecting overall trends in television ads), with more than half of these promoting noncore or unhealthy foods. Unhealthy food ads were to a greater extent delivered via more enticing ad formats compared to ads for other foods. Policies regulating food marketing to children need to be extended to cover online content, and key recommendations for developing these have been described elsewhere.⁵¹ However given the usually lengthy period it takes for legislation to be drafted, passed, and take effect against a rapidly changing digital

medial environment, awareness of children's rights and social responsibility on the part of social media service providers will be helpful in limiting the widespread promotion of unhealthy food to children.

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Appendix I. Top 25 YouTube Channels Tagged “Kids”; Ranked by Total Video Views

Rank	Channel name	Total subscribers	Total video views ^a	Summary of content	Links to list of top 10 videos, sorted by views
1	Ryan ToysReview	9,101,532	15,706,699,819	Toy reviews, toy unboxing videos	https://www.youtube.com/channel/UChGjGhZ9SOOHvBB0Y4DOO_w/videos?flow=list&view=0&sort=p
2	LittleBabyBum®	12,743,616	14,332,110,973	Nursery rhymes, children's songs	https://www.youtube.com/user/LittleBabyBum/videos?sort=p&view=0&flow=list&live_view=500
3	FunToys Collector Disney Toys Review	9,456,628	13,276,059,099	Toy reviews, toy unboxing videos	https://www.youtube.com/user/DisneyCollectorBR/videos?sort=p&view=0&flow=list
4	Маша и Медведь (Masha and the Bear)	11,235,425	12,862,038,609	Animated series	https://www.youtube.com/user/MashaMedvedTV/videos?view=0&flow=list&sort=p
5	El Reino Infantil (The Children's Kingdom)	8,864,823	10,749,243,080	Children's songs	https://www.youtube.com/user/ReinoMariaElenaWalsh/videos?flow=list&view=0&sort=p
6	Family Fun Pack	5,714,341	10,513,188,018	Family vlogs	https://www.youtube.com/user/familyfunpack/videos?sort=p&flow=list&view=0
7	ChuChu TV Nursery Rhymes & Kids Songs	11,923,242	10,474,220,335	Nursery rhymes, children's songs	https://www.youtube.com/user/TheChuChuTV/videos?sort=p&view=0&flow=list
8	Baby Big Mouth	6,520,402	8,617,274,138	Surprise eggs, educational videos	https://www.youtube.com/user/ItsBabyBigMouth/videos?sort=p&flow=list&view=0
9	Blu Toys Club Surprise	5,681,092	7,847,702,626	Surprise eggs and other toys	https://www.youtube.com/user/Blucollection/videos?sort=p&view=0&flow=list
10	DCToys Sandaroo Kids	5,528,709	7,327,029,791	Toy reviews, toy unboxing videos	https://www.youtube.com/user/DisneyCarToys/videos?sort=p&flow=list&view=0
11	[토이푸딩] ToyPudding TV	9,182,365	7,323,752,103	Surprise eggs and other toys	https://www.youtube.com/user/toypudding/videos?sort=p&flow=list&view=0
12	Super Simple Songs—Kids Songs	7,077,954	7,271,403,947	Children's songs	https://www.youtube.com/user/SuperSimpleSongs/videos?sort=p&flow=list&view=0
13	DCTC Toy Channel	8,145,406	7,081,696,749	Toy reviews, toy unboxing videos	https://www.youtube.com/user/MaterCarClub/videos?view=0&flow=list&sort=p
14	Toy Freaks	7,925,209	6,735,039,517	Family vlogs	https://www.youtube.com/user/3uptheyinyang/videos?flow=list&sort=p&view=0
15	Toys and Funny Kids Surprise Eggs	7,868,336	6,491,017,480	Surprise eggs	https://www.youtube.com/user/toysandfunnykids/videos?sort=p&view=0&flow=list
16	Galinha Pintadinha	8,100,926	6,425,823,195	Children's songs	https://www.youtube.com/user/juptube/videos?sort=p&flow=list&view=0
17	Webs & Tiaras— Toy Monster Compilations	6,772,315	6,281,291,402	Skit videos	https://www.youtube.com/channel/UC0gNKhFMg-bKyNNZ_MB3D9Q/videos?flow=list&sort=p&view=0
18	Лунтик (Luntik)	2,373,790	5,843,660,798	Animated series	https://www.youtube.com/user/luntik/videos?flow=list&view=0&sort=p
19	ToyScouter	8,561,187	5,682,006,994	Toy reviews	https://www.youtube.com/user/toyscouter/videos?sort=p&view=0&flow=list
20	CVS 3D Rhymes	7,052,324	5,620,537,315	Nursery rhymes, children's songs	https://www.youtube.com/user/CyberVillageSolution/videos?sort=p&view=0&flow=list
21	Mister Max	5,053,436	5,459,876,998	Vlogs, toy reviews	https://www.youtube.com/channel/UC_8PAD0Qmi6_gpe77S1Atgg/videos?flow=list&view=0&sort=p

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Appendix I. Top 25 YouTube Channels Tagged “Kids”; Ranked by Total Video Views *continued*

Rank	Channel name	Total subscribers	Total video views ^a	Summary of content	Links to list of top 10 videos, sorted by views
22	LEGO	3,397,763	5,423,117,724	Toys showcase	https://www.youtube.com/user/LEGO/videos?sort=p&view=0&flow=list
23	Mother Goose Club	4,507,439	5,404,368,023	Children’s songs	https://www.youtube.com/user/MotherGooseClub/videos?view=0&sort=p&flow=list
24	Miss Katy	4,815,998	5,320,356,429	Vlogs, toy reviews	https://www.youtube.com/channel/UCcartHVtvAUzfjflyeT_Gg/videos?sort=p&flow=list&view=0
25	DisneyJuniorUK	3,449,481	4,398,337,349	Animated videos	https://www.youtube.com/user/DisneyJuniorUK/videos?sort=p&flow=list&view=0

^aTotal subscriber count and total video views as of October 5, 2017.

<https://socialblade.com/youtube/top/tag/kids/videoviews>

Appendix 2. Food and Beverage Categories

Food category

Core and healthy food categories

Breads, rice, and rice products without added fat, sugar, or salt

Low sugar and high fiber breakfast cereals (<20 g sugar/100 g and >5 g dietary fiber/100 g)

Fruits and fruit products without added fats, sugars, or salt

Vegetables and vegetable products without added fats, sugars, or salt

Plain milks and yoghurts, cheese, and alternatives

Meat and meat alternatives

Oils high in mono- or polyunsaturated fats, and low fat sauces (<10 g fat/100 g)

Low fat/salt meals: meals (≤ 6 g saturated fat/serve, ≤ 900 mg sodium/serve), soups (<2 g fat/100 g, exclude dehydrated), sandwiches, mixed salads

Healthy Snacks: <600 kJ/serve, <3 g saturated fat/serve and <200 mg sodium/serve

Baby foods (exclude milk formulae)

Bottled water (include unflavored mineral and soda waters)

Noncore and unhealthy food categories

High sugar and/or low fiber breakfast cereals (>20 g sugars/100 g or <5 g dietary fiber/100 g)

Flavored/fried instant rice and noodle products

Sweet breads/cakes/muffins/buns, sweet glutinous rice balls/cakes, high fat savory biscuits, pies, and pastries, sweet sticky rice/rice pudding

Meat and meat alternatives processed or preserved in salt

Sweet snack foods—jelly, sugar-coated dried fruits or nuts, nut/seed-based bars and slices, sweet rice bars, and tinned fruit in syrup

Savory snack foods (added salt or fat)—chips, dried spicy peas, fruit chips, savory crisps, extruded snacks, popcorn (exclude plain), salted or coated nuts, and other fried snacks

Fruit juice/drinks (<98% fruit)

Flavored or dairy products with added sugar and alternatives

Ice cream, iced confection, and desserts

Chocolate and candy

Fast food (not only healthier options advertised)

High fat/salt meals—frozen or packaged meals (>6 g saturated fat/serve, >900 mg sodium/serve)

Other high fat/salt products—high fat savory sauces (>10 g fat/100 g), soups (>2 g fat/100 g; all dehydrated)

Sugar sweetened drinks

Alcohol

Miscellaneous

Recipe additions (including soup cubes, oils, dried herbs, and seasonings)

Vitamin/mineral or other dietary supplements

Tea and coffee

Baby and toddler milk formulae

Fast food (only healthier options advertised)

Fast food (not only healthier options advertised)

Fast-food restaurant (no foods or beverages advertised)

Local restaurant

Supermarkets (only core and healthy foods advertised)

Supermarkets (not only core and healthy foods advertised)

Supermarkets (no foods or drinks advertised)