



Digital Advertising to Children

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Advertising to children and teenagers is a multibillion-dollar industry. This policy statement reviews the forms of advertising that children and teenagers encounter, including newer forms of digital marketing, such as sponsored content, influencers, data collection, persuasive design, and personalized behavioral marketing driven by machine learning. Parents and pediatric health care providers need to be aware of the ways different marketing messages reach children and teenagers, including Internet sites, social media, and mobile apps. Evidence suggests that exposure to advertising is associated with unhealthy behaviors, such as intake of high-calorie, low-nutrient food and beverages; use of tobacco products and electronic cigarettes; use of alcohol and marijuana; and indoor tanning. Children are uniquely vulnerable to the persuasive effects of advertising because of immature critical thinking skills and impulse inhibition. School-aged children and teenagers may be able to recognize advertising but often are not able to resist it when it is embedded within trusted social networks, encouraged by celebrity influencers, or delivered next to personalized content. This policy statement expresses concern about the practice of tracking and using children's digital behavior to inform targeted marketing campaigns, which may contribute to health disparities among vulnerable children or populations. Pediatricians should guide parents and children to develop digital literacy skills to prevent or mitigate negative outcomes, but it is equally important that policy makers and technology companies embrace digital design, data collection, and marketing practices within today's broad digital environment that support healthier decision-making and outcomes.

abstract

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THE CHANGING LANDSCAPE OF MARKETING TO CHILDREN

Advertising to children and teenagers via various forms of media has occurred for decades, with expenditures of \$3.2 billion for nondigital and \$900 million for digital advertising in the United States in 2018.¹ Children and teenagers encounter advertising through television, radio, print media, the Internet, and their mobile phones. Advertising can take many forms, including images, videos, and games that advertise specific brands.

However, since the introduction of mobile media and Internet-connected devices (eg, virtual assistants, Internet-connected toys), advertising now comprises a wider range of marketing approaches for which influences on child behavior have not been well described. The purpose of this policy statement is to review the developmental science explaining how children and teenagers are vulnerable to advertising, review the emerging research on novel marketing approaches and evidence regarding advertising and child health, and offer guidance to parents, pediatric health care providers, industry, and policy makers about the needs and rights of children in the modern digital media environment.

CHILDREN'S UNIQUE VULNERABILITY TO ADVERTISING

Research on children's understanding of television advertising² demonstrates that children 7 years and younger have limited ability to understand the persuasive intent (ie, that someone else is trying to change their thoughts and behavior) of the advertiser. From ages 7 to 11 years, children can start to recognize television advertising and persuasive intent with their parents' assistance but lack the abstract thinking skills that help individuals recognize advertising as a larger commercial concept. At ~12 years of age and older, teenagers were able to identify television advertisements (ads) and advertisers' intention to change behavior (which is why some countries, such as Sweden and Brazil, have laws banning advertising to children younger than 12 years).

However, recognition of persuasive intent does not necessarily lead to the ability to resist marketing, especially with highly appealing products. Marketers use emotional or subconscious approaches³ to engage children, such as using trusted characters⁴ or celebrities. At as young as age 2, a child can easily identify

a familiar character as well as correctly connect them with an endorsed product.⁵

Most importantly, most research on children's understanding of advertising involves television and print ads only, but newer forms of advertising found in mobile and interactive media and smart technologies, often powered by personal data, are more difficult to identify. They do not necessarily occur in a predictable manner and are often integrated into the content.⁶ Advertising may also be linked to rewards or be embedded in trusted social networks or personalized digital platforms, which may undermine children's abilities to identify or critically think about advertising messages. Regulations on television advertising⁷ have not yet been updated for the modern digital environment.

NEW MARKETING APPROACHES

The nature of media used by children and teenagers has changed dramatically in the past decade, and children now spend more time on the Internet, social media, user-created content, video games, mobile applications (apps), virtual or augmented reality, virtual assistants, and Internet-connected toys. The Internet allows advertisers to contact, track, and influence users, as guided by behavioral data collection; a user's digital trail of location, activities, in-app behavior, likes, and dislikes contributes to a digital profile shared among many companies that can be used to make advertising messages more effective.

Sponsored Content and Influencers

User-created content on social media platforms and video-streaming services (eg, TikTok, YouTube) frequently involves commercial content and marketing messages. Examples include the highly popular unboxing and toy-play videos as well as influencers reviewing or using

products with sponsorship from companies. Child advocacy groups have highlighted the large amount of child-directed influencer marketing, often undisclosed, which is not allowed on children's television (ie, "host selling," using stars of a television program in commercials airing during that program) because it is harder for children to identify or resist.⁸

Data and Privacy

Data collection for commercial purposes includes use of cookies in a user's browser, which record and follow Web page history; the collection of posts, likes, purchases, and viewing history by apps such as Facebook and Instagram or search engines such as Google⁹; and collection of data via apps granted permission to track device data, such as location or contacts. Software mines such data from user accounts, devices, and virtual assistants and often shares data with third-party companies to develop a profile of the user, which informs the delivery of targeted ads.¹⁰ Collection of mobile device-derived data has been found to be highest in news and children's apps,¹¹ many of which evade privacy rules of the Children's Online Privacy and Protection Act (COPPA) (1998; revised in 2013) by stating that their apps are for general audiences. User data can be aggregated and stored, sold to third parties, and used to infer personal characteristics, such as sexual orientation or health problems.¹² Livingstone et al,¹² in their review of the limited literature on "datafication" of children, conclude that school-aged children up to teenagers do not comprehend the full complexity of how digital data are collected, analyzed, and used for commercial purposes. For example, studies suggest that teenagers have a more interpersonal, and less technical, conceptualization of privacy, so they may not be as aware of the ramifications of sharing data with governments or corporations

compared with sharing private information with friends or parents. Young children are more trusting of privacy-invasive technologies, such as location trackers,¹³ likely because of their convenience. In a recent report commissioned by the UK Information Commissioner's Office, children and parents reported not reading the terms and conditions or privacy notices in platforms, feeling pressured to accept cookies to use Web sites, and feeling uncomfortable with their data being used for targeted advertising.¹⁴ In addition, preschool-aged children up to teenagers in this study believed they should have the right to erase or limit the use of their digital data.¹⁴ However, data-brokering services are highly complex, using evolving algorithms across multiple platforms, with business practices that are intentionally opaque, which even adults do not fully understand.¹⁵

Beyond advertising, it is also important for families to understand how data collection influences the information that reaches them through the Internet. Previous online behaviors shape what is delivered to users via news, notifications, and social media feeds, creating a filter bubble in which all input, unbeknownst to users, is tailored to their interests and creates false norms that can undermine healthy behaviors.

In the United States, COPPA is meant to "place parents in control over what information is collected from their young children online" and limit the data that child-directed Web sites, apps, or other online services collect, use, or disclose to third parties in the absence of parental consent.¹⁶ However, COPPA leaves open many gaps in its protection. It generally does not protect children when they are using Web sites or apps that are considered targeted to a general audience, nor does it apply after a child is 13 years of age. In addition, the law has not been enforced

reliably.¹¹ The European Union's General Data Protection Regulation (2018) is more ambitious in protecting user privacy, and the UK Information Commissioner's Office has recently introduced an age-appropriate design code to address children's vulnerabilities regarding data collection and persuasive design.¹⁷

Persuasive Design and Behavioral Marketing

Design elements intended to nudge users into specific behaviors (by constraining choices, highlighting preferred buttons to click, or providing rewards for preferred behavior) are now a common part of digital design.¹⁸ These design elements extend digital engagement in ways that increase exposure to advertising, which children and teenagers may not be able to identify or resist. This targeted marketing also results in different products being advertised to different populations, which may accentuate existing disparities.¹²

Gamified Ads and In-App Purchases

Newer Internet marketing practices in the 2000s included gamified advertising ("advergaming"), which rewards users for watching ads or buying products,¹⁹ but have evolved to include advertising that is less evident to the child. For example, an analysis of the most-downloaded free apps for children younger than 5 years on Google Play revealed that 96% contained commercial content, including hidden ads, interstitial ads that pop up automatically, and ads that, when viewed, provided incentives, such as more game tokens or making gameplay easier.⁶ App characters were noted to encourage in-app purchases in some games.⁶

Artificial Intelligence and Machine Learning

Artificial intelligence and machine learning form the core of many technologies accessed by children and

teenagers, including virtual assistants. It is unclear how much data are being collected, how data are being processed or used to shape query responses for the purposes of marketing to children, or how parents can access the information. Young children attribute more animism to and place more trust in these artificial intelligence agents and are more likely to share information with them.²⁰

SPECIFIC HEALTH-RELATED CONCERNS

Food Advertising and Childhood Obesity

Food marketing funding today is less dependent on television and is instead concentrated on integrated marketing campaigns and cross-platform promotion to spur children's requests and demands for products,²¹ as highlighted in the recent comprehensive report by the University of Connecticut Rudd Center for Food Policy and Obesity.²² Food advertising has been linked to higher obesity risk via ads for high-calorie, low-nutrient food and beverages (which influence diet and purchases).²³ Screen media consumption is inversely correlated with fruit and vegetable intake and directly correlated with energy-dense, nutrient-poor snacks, drinks, and food.²⁴ Ads also promote intake of foods that contribute to dental caries.²⁵ More fast food and sugar beverages are advertised in African American, Hispanic, and low-income communities, according to the Rudd report,²⁶ as are candy and cereals. Nearly 40% of ads on television targeted to African American and Hispanic populations are for fast food and other restaurants. Unhealthy food advertising in 13- to 17-year-olds is also correlated with development of media-driven norms that supersede healthier family norms.²⁷ Influencers can sway teenagers toward unhealthy choices; Bragg et al²⁸ identified popular music stars endorsing 18%

of surveyed ads; 49 (71%) promoted sugar-sweetened beverages, and 21 (80.8%) endorsed foods were energy dense and nutrient poor. In an experimental study, Coates et al,²⁹ found that school-aged children who viewed mock profiles of influencers promoting unhealthy snacks showed a significant increase in intake of unhealthy snacks and total calories compared with children who viewed influencers promoting nonfood items. Folkvord et al³⁰ observed increased caloric intake in 7- to 10-year-olds playing advergames as well, which children with high impulsivity had an especially hard time inhibiting.

Tobacco and Electronic Cigarette Advertising

Multiple studies have revealed that in teenagers, attention and receptivity to cigarette advertising is correlated with both current and future use.³¹ Cigarette ads on television and radio were banned in 1971 for this reason. This correlation has been found with emerging tobacco products, such as electronic cigarettes (e-cigarettes),^{32,33} to which the majority of middle and high school students have been exposed.³⁴ E-cigarette companies have used social media influencers, hashtags, music videos, and other informal social media presence to advertise their products,³⁵ although companies have deleted their own official social media accounts.

Alcohol Advertising

Studies have revealed increased exposure to alcohol content for middle and high school youth via social media,³⁶ banner ads, and video ads, with disparate exposure for African American,³⁷ Hispanic, and American Indian youth.³⁸ A review by Jernigan et al³⁹ of 12 longitudinal studies published from 2009 to 2015 demonstrated a positive correlation between marketing exposure and receptivity and alcohol consumption in youth, and the authors concluded that “existing self-regulatory systems do not meet their intended goal of

protecting vulnerable populations from alcohol marketing.”

Marijuana Advertising

The legalization of marijuana in many states has led to media and point-of-sale advertising seen by people younger than 21 years⁴⁰ or increased exposure through social media mentions, sometimes accompanied by cartoon characters or other design elements attracting to children.⁴¹ Point-of-service advertising has been found to be more common in areas of lower socioeconomic status and minority populations.⁴² Marijuana advertising exposure is associated with heavier use, use of marijuana concentrates and edibles in young adults,⁴³ and higher probability of marijuana use and intentions in middle schoolers.⁴⁴

Cultural Biases, Body Appearance, and Teenager Self-image

By presenting ideals of body appearance, ads can convey cultural biases, such as skin color (eg, skin-lightening products), hair traits (eg, hair-straightening products), or unhealthy body weight ideals (eg, diet products or muscle-building supplements). In addition, ads for indoor tanning salons often target teenagers. Because indoor tanning is considered a class 2 carcinogen, such advertising is restricted over traditional media. For this reason, tanning salons actively use social media as a strategy for attracting and retaining customers,⁴⁵ encouraging high-frequency tanning,⁴⁶ and lowering the perception of the risks of tanning.⁴⁷

DIGITAL LITERACY

Digital literacy requires that children, teenagers, and parents understand that technology is created by other humans with their own agendas and that they can accept or reject its messages, identify advertising and persuasive intent, reflect on their own reactions to media, and engage with media on the basis of their own

intentions (rather than reacting to engagement-promoting design). However, Livingstone et al¹² identified disparities in knowledge about technology and privacy among parents of different socioeconomic status or digital skills. For example, parents from lower-income backgrounds were more likely to place credence in the learning value of apps marketed as educational for their young children,⁴⁸ despite a lack of evidence-based data for most such products.⁴⁹ Thus, differences in digital literacy skills and knowledge by socioeconomic status may contribute to digital disparities.

Digital literacy programs have been developed to teach children how to think about technology, not just how to use it. For example, Zarouali et al¹⁰ showed that teenagers responded more favorably to specifically targeted rather than nontargeted ads, but teenagers who understood the privacy intrusions that led to such targeted advertising were more skeptical and less likely to purchase the product. Educational programs and campaigns are recommended, in combination with the design changes discussed below, to mitigate this influence and persuasion.

CONCLUSIONS

Many digital media resources, including apps, programs, games, and educational materials, are subsidized and supported by advertising dollars. Children’s and teenagers’ unique developmental needs make them more vulnerable to negative physical, mental, and financial health effects of digital marketing. Although parents play a large role in helping their children be critical of media messages, identify surreptitious advertising approaches, and resist their influence, it is also crucial that there are measures in place in children’s digital media environments to protect their needs.

RECOMMENDATIONS

For Parents

Excessive media use has been linked with negative health outcomes in children and teenagers. American Academy of Pediatrics (AAP) policies regarding media^{50,51} provide guidance for parents and families regarding limiting media use and engaging in healthy conversation about media messages. However, parents should not be the only ones held responsible for child privacy in a digital environment that is predicated on a business model of advertising and data collection in which the default settings serve to compromise user privacy or potentiate disparities. Parents can be effective in teaching children and teenagers to think critically about digital media, but this AAP policy statement places the primary duty to protect children on technology developers and policy makers, who should create a digital environment in which families can access content that provides opportunities rather than delivers profits.

To empower parents to help their children, the following steps and resources are recommended:

1. Build digital, privacy, and design savviness. Know what your children are downloading and accessing so that you can help them be an informed consumer, and demand better-designed digital products for children (helpful resources: <https://www.childrenscommissioner.gov.uk/wp-content/uploads/2018/11/who-knows-what-about-me-infographic.pdf> and <https://www.consumerreports.org/digital-security/online-security-and-privacy-guide/>).
2. Enhance and monitor privacy settings on personal devices, apps, social media, virtual assistants, and wireless networks. Understand the differences between privacy settings that

determine what other users can see about you and the platform collecting data about you (helpful resource: <https://www.commonsensemedia.org/privacy-and-internet-safety>).

3. Create a family media use plan that intentionally uses high-quality media content that has as few ads as possible, limits data collection, and encourages discussion about privacy (helpful resource: <https://www.healthychildren.org/English/media/Pages/default.aspx>).
4. Teach children to analyze the ads they see, identify algorithms that affect their streaming content, understand what personal data are collected, and be savvy about the persuasive intent behind the design of the technologies they use (helpful resource: Digital literacy toolkit from Sonia Livingstone: www.myprivacy.uk).
5. Talk to school administrators and teachers about the digital privacy of the technology tools they use (helpful resources: Campaign for a Commercial-Free Childhood parent toolkit for student privacy [<https://commercialfreechildhood.org/pf/parent-toolkit-student-privacy/>] and Common Sense Media privacy evaluations of educational technology products <https://privacy.commonsense.org/evaluations/1>).

The best thing parents can do to encourage digital literacy in their children is to talk openly and critically about media from the time children are young. For example, when watching a television show or using mobile technology, parents can express their skepticism or ask children their opinions. Alternatively, when children ask to buy a specific product, parents can ask questions to explore how advertising might have contributed to that desire. Parents can speak with younger children about what ads are trying to sell or why their favorite app has design

features, such as autoplay, that keep them watching longer. For older children, discussions can revolve around influencers, unpacking messages about consumerism, or whether they understand all of their privacy settings. These are just a few examples of how such discussions allow parents to understand the extent of their children's literacy (or lack thereof), help to align children's media use with their family values, and help children to feel comfortable reaching out to their parents when they have concerns about online content or privacy.

For Providers

The AAP recommends the following:

1. Understand how children and teenagers are targeted by advertisers, and help parents understand children's specific vulnerability to persuasive design and targeted ads. Encourage parents to be discerning consumers of their child's media and demand better design and data collection practices.
2. Ask patients and families about any media use concerns as a part of routine health maintenance. Encourage families to use the AAP family media use plan to set media use limits, adopt privacy-preserving behaviors, and engage in parent-child communication regarding digital media.
3. Provide educational materials and references (listed above) to help parents and patients build digital literacy, as developmentally appropriate. Consider using a parent or child's use of a mobile device during visits as a teachable moment to identify ads or persuasive design (helpful resource: AAP News article on building digital literacy: <https://www.aappublications.org/news/2019/04/24/masteringmedia042419>).
4. Recommend parents to think of themselves as role models for

digital media use, digital citizenship, and digital literacy. Encourage discussions about Internet privacy and persuasive design, and recommend settings or filters to reduce ads and improve privacy.

5. Advocate for policies and regulations that limit advertising and data collection from children and teenagers. Pediatricians can advocate with local schools to avoid educational technology that is commercial and does not protect children's privacy. Pediatricians and parents can also ask for the establishment of digital literacy curricula in public schools so that children from all socioeconomic backgrounds can build equitable understanding of digital marketing and persuasive design.

For Industry and Policy Makers

The AAP recommends the following:

1. Policy makers and technology companies should adopt stricter privacy regulations for all users (including children and teenagers), which include data collection from home technologies, mobile devices, and other Internet-connected devices or toys. Disclosure of such collection should be prominently provided at appropriate literacy and developmental levels, and technology companies should report what data will be collected, how the data will be used, with whom data might be shared, and the risks and benefits to the consumer. Information about blocking this data collection and deleting personal information permanently should be provided. Default settings for platforms, programs, apps, and Internet-connected toys should be set at the highest level of privacy.
2. Strengthen COPPA enforcement to prohibit personal and location data collection from apps and Web sites clearly used by children younger than 13 years without parental consent and by anyone 13 to 17 years of age without the user's consent. For Web sites and apps used by multiple age groups, such as search engines and YouTube, provide alternative services that do not collect or aggregate data and that limit advertising. Ban targeted (ie, data-driven behavioral) advertising to individuals younger than 18 years.
3. Ban all commercial advertising to children younger than 7 years, and limit advertising to older children and teenagers. All advertising should be clearly labeled as such (eg, as sponsored content).
4. Prohibit in-app host selling and purchases, including loot boxes that pressure gamers to spend money during game play. Require clear separation of content and advertising in media designed for children, including product placement in child-directed videos.
5. Reduce advertising of unhealthy foods and beverages to children and teenagers, particularly targeted advertising that exacerbates disparities when combined with structural sources of inequality (eg, healthy food scarcity, public underinvestment in opportunities for exercise or play).
6. In accordance with the AAP policy statement on tobacco,⁵² depictions of tobacco products (including e-cigarettes), tobacco product use, and images associated with tobacco product brands in movies and video games should be restricted. Internet sales of tobacco products should be banned because they are easily accessed by minors.

7. In accordance with previous AAP policy statements on marijuana⁵³ and alcohol,⁵⁴ limit access and marketing of these substances to youth (eg, by using mascots, cartoon characters, or influencers popular with children and teenagers).
8. Require and fund digital literacy curricula in schools. Prohibit use of digital media that contain advertising in the classroom.
9. Fund and promote research on the effects of advertising in digital media in children and teenagers to further identify risks inherent in data collection, digital profiling, and selective targeting of disadvantaged communities and to inform age-appropriate design guidance.
10. Increase efforts to promote digital equity by improving access to quality commercial-free content.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
COPPA: Children's Online Privacy and Protection Act
e-cigarette: electronic cigarette

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REFERENCES

1. Statista. Spending on advertising to children worldwide from 2012 to 2021, by format (in billion US dollars). Available at: <https://www.statista.com/statistics/750865/kids-advertising-spending-worldwide/>. Accessed August 26, 2019
2. John DR. Consumer socialization of children: a retrospective look at twenty-five years of research. *J Consum Res*. 1999;26(3):183–213
3. Nairn A, Fine C. Who's messing with my mind? The implications of dual-process models for the ethics of advertising to children. *Int J Advert*. 2008;27(3):447–470
4. Hoffner C. Children's wishful identification and parasocial interaction with favorite television characters. *J Broadcast Electron Media*. 1996;40(3):389–402
5. Neeley SM, Schumann DW. Using animated spokes-characters in advertising to young children: does increasing attention to advertising necessarily lead to product preference? *J Advert*. 2004;33(3):7–23
6. Meyer M, Adkins V, Yuan N, Weeks HM, Chang YJ, Radesky J. Advertising in young children's apps: a content analysis. *J Dev Behav Pediatr*. 2019; 40(1):32–39
7. Beales JH III. *Advertising to Kids and the FTC: A Regulatory Retrospective That Advises the Present*. Washington, DC: US Federal Trade Commission; 2004. Available at: https://www.ftc.gov/sites/default/files/documents/public_statements/advertising-kids-and-ftc-regulatory-retrospective-advises-present/040802adstokids.pdf. Accessed August 26, 2019
8. Campaign for a Commercial-Free Childhood, Center for Digital Democracy, and Public Citizen. Complaint, request for investigation, and request for policy guidance on the deceptive practice of influencer marketing directed to children. 2016. Available at: www.commercialfreechildhood.org/sites/default/files/FTCInfluencerComplaint.pdf. Accessed August 26, 2019
9. Goldfarb A. What is different about online advertising? *Rev Ind Organ*. 2014; 44:115–129
10. Zarouali B, Ponnet K, Walrave M, Poels K. "Do you like cookies?" Adolescents' skeptical processing of retargeted Facebook-ads and the moderating role of privacy concern and a textual debriefing. *Comput Human Behav*. 2017;69:157–165
11. Binns R, Lyngs U, Van Kleek M, Zhao J, Libert T, Shadbolt N. Third party tracking in the mobile ecosystem. 2018. Available at: <https://arxiv.org/pdf/1804.03603.pdf>. Accessed October 1, 2019
12. Livingstone S, Stoilova M, Nandagiri R. *Children's Data and Privacy Online: Growing up in a Digital Age. An Evidence Review*. London: London School of Economics and Political Science; 2019
13. Gelman SA, Martinez M, Davidson NS, Noles NS. Developing digital privacy: children's moral judgments concerning mobile GPS devices. *Child Dev*. 2018; 89(1):17–26
14. UK Information Commissioner's Office. Towards a better digital future: informing the age appropriate design code. 2019. Available at: <https://ico.org.uk/media/about-the-ico/consultations/2614763/ico-rr-report-0703.pdf>. Accessed August 26, 2019
15. Yao Y, Lo Re D, Wang Y. Folk models of online behavioral advertising. In: *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*; February 25–March 1, 2017; Portland, OR
16. US Federal Trade Commission. Complying with COPPA: frequently asked questions. Available at: <https://www.ftc.gov/tips-advice/business-center/guidance/complying-coppa-frequently-asked-questions#General%20Questions>. Accessed August 26, 2019
17. UK Information Commissioner's Office. Age appropriate design: a code of practice for online services: consultation document. 2019. Available at: <https://ico.org.uk/media/about-the-ico/consultations/2614762/age-appropriate-design-code-for-public-consultation.pdf>. Accessed August 26, 2019
18. Fogg BJ. *Persuasive Technology: Using Computers to Change What We Think and Do*. San Francisco, CA: Morgan Kaufmann Publishers; 2002
19. Verhellen Y, Oates C, De Pelsmacker P, Dens N. Children's responses to traditional versus hybrid advertising formats: the moderating role of persuasion knowledge. *J Consum Policy*. 2014;37:235–255
20. Druga S, Williams R, Breazeal C, Resnick M. "Hey Google is it OK if I eat you?": initial explorations in child-agent interaction. In: *Proceedings of the 2017 Conference on Interaction Design and Children*; June 27-30, 2017; Stanford, CA
21. US Federal Trade Commission. Review of food marketing to children and adolescents – follow-up report. Available at: <https://www.ftc.gov/reports/review-food-marketing-children-adolescents-follow-report>. Accessed August 26, 2019
22. Frazier WC, Harris JL. *Trends in Television Food Advertising to Young People: 2015 Update*. Hartford, CT: University of Connecticut Rudd Center for Food Policy & Obesity; 2016
23. Thai CL, Serrano KJ, Yaroch AL, Nebeling L, Oh A. Perceptions of food advertising and association with consumption of energy-dense nutrient-poor foods among adolescents in the United States: results from a national survey. *J Health Commun*. 2017;22(8):638–646
24. Pearson N, Biddle SJ. Sedentary behavior and dietary intake in children, adolescents, and adults. A systematic

- review. *Am J Prev Med.* 2011;41(2): 178–188
25. Rodd HD, Patel V. Content analysis of children's television advertising in relation to dental health. *Br Dent J.* 2005;199(11):710–712; discussion 713
 26. Harris JL, Shehan C, Gross R, et al. *Food Advertising Targeted to Hispanic and Black Youth: Contributing to Health Disparities.* Hartford, CT: Rudd Center for Food Policy & Obesity; 2015
 27. Beaudoin CE. The mass media and adolescent socialization: a prospective study in the context of unhealthy food advertising. *Journal Mass Commun Q.* 2014;91(3):544–561
 28. Bragg MA, Miller AN, Elizee J, Dighe S, Elbel BD. Popular music celebrity endorsements in food and nonalcoholic beverage marketing. *Pediatrics.* 2016; 138(1):e20153977
 29. Coates AE, Hardman CA, Halford JC, Christiansen P, Boyland EJ. Social media influencer marketing and children's food intake: a randomized trial. *Pediatrics.* 2019;143(4):e20182554
 30. Folkvord F, Anschütz DJ, Nederkoorn C, Westerik H, Buijzen M. Impulsivity, “advergaming,” and food intake. *Pediatrics.* 2014;133(6):1007–1012
 31. Perks SN, Armour B, Agaku IT. Cigarette brand preference and pro-tobacco advertising among middle and high school students - United States, 2012–2016. *MMWR Morb Mortal Wkly Rep.* 2018;67(4):119–124
 32. Agaku IT, Ayo-Yusuf OA. The effect of exposure to pro-tobacco advertising on experimentation with emerging tobacco products among US adolescents. *Health Educ Behav.* 2014;41(3):275–280
 33. Mantey DS, Cooper MR, Clendennen SL, Pasch KE, Perry CL. E-cigarette marketing exposure is associated with e-cigarette use among US youth. *J Adolesc Health.* 2016;58(6):686–690
 34. Singh T, Marynak K, Arrazola RA, Cox S, Rolle IV, King BA. Vital signs: exposure to electronic cigarette advertising among middle school and high school students - United States, 2014. *MMWR Morb Mortal Wkly Rep.* 2016;64(52):1403–1408
 35. Huang J, Kornfield R, Szczypka G, Emery SL. A cross-sectional examination of marketing of electronic cigarettes on Twitter. *Tob Control.* 2014;23(suppl 3): iii26-iii30
 36. Jernigan DH, Rushman AE. Measuring youth exposure to alcohol marketing on social networking sites: challenges and prospects. *J Public Health Policy.* 2014; 35(1):91–104
 37. D'Amico EJ, Martino SC, Collins RL, et al. Factors associated with younger adolescents' exposure to online alcohol advertising. *Psychol Addict Behav.* 2017; 31(2):212–219
 38. Alaniz ML, Wilkes C. Pro-drinking messages and message environments for young adults: the case of alcohol industry advertising in African American, Latino, and Native American communities. *J Public Health Policy.* 1998;19(4):447–472
 39. Jernigan D, Noel J, Landon J, Thornton N, Lobstein T. Alcohol marketing and youth alcohol consumption: a systematic review of longitudinal studies published since 2008. *Addiction.* 2017;112(suppl 1):7–20
 40. Fiala SC, Dille JA, Firth CL, Maher JE. Exposure to marijuana marketing after legalization of retail sales: Oregonians' experiences, 2015–2016. *Am J Public Health.* 2018;108(1):120–127
 41. Cabrera-Nguyen EP, Cavazos-Rehg P, Krauss M, Bierut LJ, Moreno MA. Young adults' exposure to alcohol- and marijuana-related content on Twitter. *J Stud Alcohol Drugs.* 2016;77(2): 349–353
 42. Siahpush M, Farazi PA, Kim J, et al. Social disparities in exposure to point-of-sale cigarette marketing. *Int J Environ Res Public Health.* 2016; 13(12):E1263
 43. Krauss MJ, Sowles SJ, Sehi A, et al. Marijuana advertising exposure among current marijuana users in the U.S. *Drug Alcohol Depend.* 2017;174:192–200
 44. D'Amico EJ, Miles JN, Tucker JS. Gateway to curiosity: medical marijuana ads and intention and use during middle school. *Psychol Addict Behav.* 2015;29(3):613–619
 45. Ricklefs CA, Asdigian NL, Kalra HL, et al. Indoor tanning promotions on social media in six US cities #UVTanning #tanning. *Transl Behav Med.* 2016;6(2): 260–270
 46. Myrick JG, Noar SM, Kelley D, Zeitany AE. The relationships between female adolescents' media use, indoor tanning outcome expectations, and behavioral intentions. *Health Educ Behav.* 2017; 44(3):403–410
 47. Gall Myrick J, Noar SM, Sontag JM, Kelley D. Connections between sources of health and beauty information and indoor tanning behavior among college women. *J Am Coll Health.* 2020;68(2): 163–168
 48. Radesky JS, Eisenberg S, Kistin CJ, et al. Overstimulated consumers or next-generation learners? Parent tensions about child mobile technology use. *Ann Fam Med.* 2016;14(6):503–508
 49. Callaghan MN, Reich SM. Are educational preschool apps designed to teach? An analysis of the app market. *Learn Media Technol.* 2018;43(3):280–293
 50. Council on Communications and Media. Media and young minds. *Pediatrics.* 2016;138(5):e20162591
 51. Reid Chassiakos YL, Radesky J, Christakis D, Moreno MA, Cross C; Council on Communications and Media. Children and adolescents and digital media. *Pediatrics.* 2016;138(5): e20162593
 52. Farber HJ, Nelson KE, Groner JA, Walley SC; Section on Tobacco Control. Public policy to protect children from tobacco, nicotine, and tobacco smoke. *Pediatrics.* 2015;136(5): 998–1007
 53. Committee on Substance Abuse; Committee on Adolescence. The impact of marijuana policies on youth: clinical, research, and legal update. *Pediatrics.* 2015;135(3):584–587
 54. Quigley J; Committee on Substance Use and Prevention. Alcohol use by youth. *Pediatrics.* 2019;144(1): e20191356

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