Published in final edited form as:

Appetite. 2016 January 1; 96: 473–480. doi:10.1016/j.appet.2015.10.006.

A Toy Story: Association between Young Children's Knowledge of Fast Food Toy Premiums and their Fast Food Consumption

Meghan R. Longacre¹, Keith M. Drake^{2,3}, Linda J. Titus^{1,3,4}, Lauren P. Cleveland¹, Gail Langeloh¹, Kristy Hendricks¹, and Madeline A. Dalton^{1,3,5}

¹Department of Pediatrics, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire

²Greylock McKinnon Associates, Cambridge, Massachusetts, USA

³The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire, USA

⁴Department of Epidemiology, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire, USA

⁵Department of Community and Family Medicine, Geisel School of Medicine at Dartmouth, Lebanon, New Hampshire, USA

Abstract

Fast food restaurants spend millions of dollars annually on child-targeted marketing, a substantial portion of which is allocated to toy premiums for kids' meals. The objectives of this study were to describe fast food toy premiums, and examine whether young children's knowledge of fast food toy premiums was associated with their fast food consumption. Parents of 3- to 5-year old children were recruited from pediatric and WIC clinics in Southern New Hampshire, and completed a cross-sectional survey between April 2013–March 2014. Parents reported whether their children usually knew what toys were being offered at fast food restaurants, and whether children had eaten at any of four restaurants that offer toy premiums with kids' meals (McDonald's, Burger King, Subway, Wendy's) during the 7 days preceding the survey. Seventy-one percent of eligible parents participated (N=583); 48.4% did not receive any education beyond high school, and 27.1% of children were non-white. Half (49.7%) the children had eaten at one or more of the four fast food restaurants in the past week; one-third (33.9%) had eaten at McDonald's. The four restaurants

Correspondence concerning this article should be addressed to: Meghan Longacre, Hood Center for Children and Families, Geisel School of Medicine at Dartmouth, One Medical Center Drive, HB 7465, Lebanon, NH 03756, Tel (603) 653-0781, Fax (603) 653-0790, Meghan.Longacre@Dartmouth.edu.

Conflict of Interest: None.

Authorship: MRL, LJT, KH, and MAD designed the study; LPC and GL were responsible for acquisition of the data; KMD analyzed the data; MRL, KMD and MAD drafted the manuscript; LJT critically revised the manuscript; all authors had input on the interpretation of the data and approved the final version of the manuscript.

Ethical Standards Disclosure: This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human subjects were approved by the Committee for the Protection of Human Subjects at Dartmouth College. Written informed consent was obtained from all subjects.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

released 49 unique toy premiums during the survey period; McDonald's released half of these. Even after controlling for parent fast food consumption and sociodemographics, children were 1.38 (95% CI=1.04, 1.82) times more likely to have consumed McDonald's if they usually knew what toys were offered by fast food restaurants. We did not detect a relationship between children's toy knowledge and their intake of fast food from the other restaurants. In this community-based sample, young children's knowledge of fast food toys was associated with a greater frequency of eating at McDonald's, providing evidence in support of regulating child-directed marketing of unhealthy foods using toys.

Keywords

Fast food; toy premiums; children; fast food consumption

Introduction

Approximately one-third of U.S. children between ages 2–11 years consume food or beverages from fast food (FF) restaurants (also referred to as Quick Serve Restaurants-QSRs) daily (Powell & Nguyen, 2013; Powell, Nguyen, & Han, 2012). Children's FF consumption is associated with higher intakes of total energy, fat, and sugar; consequently, it is a dietary behavior of public health concern (Bowman, Gortmaker, Ebbeling, Pereira, Ludwig, 2004; Institute of Medicine [IOM], 2005; Powell & Nguyen, 2013). In 2009, the FF industry spent \$583 million on child-directed marketing, of which \$341 million was spent on toy premiums for kids' meals (Federal Trade Commission [FTC], 2012). Premiums are non-food items that are distributed with a company's food products; toys are one common example of a premium (FTC, 2012; Otten, 2014). These toy premiums frequently involve cross-promotional tie-ins (CPTIs) with entertainment media or children's games (FTC, 2012). By linking advertised foods with children's favorite toy, movie or television characters, CPTI marketing strategies are particularly persuasive (Connor, 2006; Jenkin, Madhvani, Signal, Bowers, 2014). In 2014, FF kids' meal toy premiums were tied to many of the highest-grossing youth-rated movies, including *How to Train Your Dragon 2*, *The Lego Movie* and *Rio 2* (IMDb, 2015). Popular TV shows (e.g., Nickelodeon's *SpongeBob Squarepants*) and toys or games (e.g., Mattel's *Barbie*) are also common themes for FF CPTI toy premiums. Because many of the toys offered in FF kids' meals feature children's favorite media characters, some researchers have suggested that it is children's relationships with these media characters, rather than the toy per se, which drives requests for FF kids' meals (Kraak & Story, 2015a). FF restaurants often offer CPTI toy premiums in collectible series, which encourage repeat visits and consumption of kids' meals to collect all toys in the series (McAlister, 2012). More than a billion kids' meals with CPTI toy premiums are sold annually (FTC, 2012), nearly all of which are high in fat, sodium, and sugar (Harris *et al.*, 2012).

Five of the ten top quick-service restaurants based on annual sales offer toy premiums with their kids' meals: Burger King, Chick-Fil-A, McDonald's, Subway and Wendy's (QSR Magazine, 2015). Among these, McDonald's surpasses the others in terms of overall sales (QSR Magazine, 2015). In 2013, McDonald's U.S. sales revenue exceeded \$35 billion,

compared to approximately \$12.7 billion for Subway, \$8.6 billion each for Wendy's and Burger King, and \$5.0 billion for Chick-Fil-A (QSR Magazine, 2015). McDonald's also outpaces the other restaurants in terms of child-targeted advertising, accounting for 70% of televised FF commercials aimed at young children, most of which include references to CPTI toys (Bernhardt *et al.*, 2013).

Experimental studies indicate that child-targeted food marketing strategies, including CPTIs with licensed media characters, influence young children's food and taste preferences (Borzekowski & Robinson, 2001; Chernin, 2008; De Droog, Valkenburg, & Buijzen, 2011; Kotler, Schiffman, & Hanson, 2012; Letona, Chacon, Roberto, & Barnoya, 2014; Robinson, Borzekowski, Matheson, & Kraemer, 2007) requests to parents to purchase advertised foods (Stoneman & Brody, 1981), and short-term consumption (i.e., in a laboratory setting) of advertised foods (Cairns, Angus, & Hastings, 2009; IOM, 2005; Kotler *et al.*, 2012; Roberto, Baik, Harris, & Brownell, 2010). Collectible toys exert an especially strong pull on young children (McAlister, Cornwell, & Cornain, 2011). McAlister (2012) found preschool children had more positive attitudes towards FF meals paired with toys compared to standalone meals, and this difference was greater if the meals were paired with collectible toys.

Despite this compelling experimental evidence, to date, no epidemiological study has examined young children's knowledge of FF toy premiums and its association with FF intake in a natural setting (Kraak & Story, 2015a). The aims of the current study were to describe FF CPTI toy premiums and examine whether preschool-age children's knowledge of FF toys was associated with their FF consumption.

Methods

Study Sample and Survey Design

Between April 2013 and March 2014, trained research assistants approached parents of preschool-age children in the waiting rooms of pediatric and Women, Infants, and Children clinics in two Southern NH metropolitan regions and invited them to complete a cross-sectional survey about children's media use, food choices, and parents' shopping practices. Eligibility for the study was based on children's age (3–5 years) and parents' ability to complete a written survey in English or Spanish. If parents had more than one age-eligible child, we selected the child who was there for an appointment. If two or more age-eligible children were present for a clinic appointment, we randomly selected one for the study. Seventy-one percent (N=583) of eligible parents completed a written informed consent and survey. The primary reason for not participating was not enough time (44% of those who declined). Parents received a \$10 gift card and children received a non-branded toy (e.g., pony figurine, small car, or coloring book) for participating.

Measures

Surveys were cognitively pre-tested with a demographically comparable sample for comprehension, face validity, and completion time. Our analysis included four FF restaurants (i.e., McDonald's, Burger King, Subway, and Wendy's) that met the following

inclusion criteria: ranked in the top 10 of quick-service restaurants, based on annual sales (QSR Magazine, 2015); provided CPTI toy premiums with kids' meals; and had at least one outlet located in each recruitment area during the data collection period (this excluded Chick-Fil-A).

Kids' Meal CPTI Toy Premiums—We monitored the release of kids' meal CPTI toy premiums at the four FF restaurants by checking FF company websites weekly throughout the data collection period. In the rare event that the website did not list or adequately describe a toy, a research assistant called one or more restaurants in the catchment areas to ascertain the current CPTI toy premium. We also recorded the type of CPTI using the following categories: movie; TV show; toy/game (including video games and apps); other.

Children's Fast Food Consumption—We ascertained children's FF consumption by asking parents, "In the past 7 days, did your child have something to eat or drink from the following fast food restaurants?" This was followed by a list of 14 FF restaurants, to which parents responded yes/no/don't know for each restaurant. We created a dichotomous outcome (yes vs. no/don't know) for McDonald's consumption, which we examined separately because of its prominence in both sales and child-targeted advertising. We combined consumption of FF from the other three restaurants into a single dichotomous variable because many fewer children ate at these restaurants. Thus, our two outcome variables were whether children ate at McDonald's and whether they ate at Burger King, Subway, or Wendy's in the past week.

Children's Knowledge of Fast Food Toys—To determine children's knowledge of FF toy promotions, we asked parents, "Does your child usually know what toys or giveaways are being offered at one or more fast food restaurants (yes; no; don't know)?" Don't know responses were coded as no. Parents who responded affirmatively were then asked: "How does your child find out about the toys or giveaways? (from me; other family members; friends; TV; the Internet; signs outside the restaurant)." Parents were able to choose multiple answers.

Covariates

We measured and adjusted for child demographics (sex, age, race [white/nonwhite]), family socioeconomic status (annual household income, parental education), parent FF consumption, and whether parents are influenced by children's liking of FF toys. Parents' FF consumption was measured by asking: "How often do you have something to eat or drink from a fast food restaurant? (never; less than once a month; less than once a week; 1–2 times a week; 3–4 times a week; 5 or more times a week)." We asked parents to indicate the extent to which "My child likes the toys or giveaways" influences their decision to go to a FF restaurant with their child (response options dichotomized: not at all vs. a little/somewhat/a lot).

Statistical Analysis

The frequencies of all FF toy variables and covariates were tabulated, and the likelihood that different subgroups had eaten at McDonald's or Burger King/Subway/Wendy's in the past

week was compared. We used Poisson regression with robust variance estimates to account for the binomial outcome variables (Huber, 1967; Zou, 2004) to generate unadjusted and adjusted risk ratios for the association between children's characteristics and FF consumption. To maximize the sample size, we used multiple imputation by chained equations (Azur, Stuart, Frangakis, & Leaf, 2011) to impute values for all variables in the multivariate models with missing data (3.6% for past week FF consumption, 2.2% for FF toy knowledge, 5.0% for race, 6.2% for household income, 3.9% for parent education). All analyses were conducted in 2015 in STATA version 12 (StataCorp LP, College Station, Texas).

Results

Between April 2013 and March 2014, a total of 49 CPTI toy premiums were released by the four FF restaurants (Table 1). Nearly half of these toys (n=24) were released by McDonald's. Overall, about 30% of CPTIs were associated with a movie; 30% with a toy/game; and 24.5% with TV shows. McDonald's and Burger King CPTIs were fairly well-distributed among movies, TV shows, and toys/games (Figure 1). Subway had the greatest proportion of CPTIs related to a movie, and Wendy's CPTIs were most often linked with toys/games.

Child gender and age were fairly evenly distributed, although there were slightly fewer five year olds (Table 2). Seventy-three percent of children were white (compared to 91.6% in NH) (U.S. Census Bureau, 2015). The majority (59.1%) of non-white children were Hispanic. Fifty-two percent of the children's families earned \$50,000 per year or less [NH median income = \$64,916 (U.S. Census Bureau, 2015)] and 48.4% of parents did not receive any education beyond high school. Nearly one-third (31.8%) of parents reported eating FF at least once per week, and 27.4% reported that their decision to go to a FF restaurant was influenced by their child liking the toys. Approximately one of six (15.8%) parents reported that their child usually knew what toys were offered by chain FF restaurants. Among children who usually knew about the toys (n=90), parents reported that TV advertisements (50.0%) and signs outside of restaurants (43.3%) were the most common ways children found out about the toys (Figure 2).

In the past week, almost half (49.7%) of the children ate at one or more of the FF restaurants offering CPTI toy premiums. Approximately one-third (33.9%) of children had eaten at McDonald's, and 24.3% had eaten at Burger King, Wendy's, or Subway (13.4%, 9.8% and 5.2%, respectively; these percentages are not mutually exclusive). A total of 49 children had eaten at both McDonald's and either Burger King, Wendy's, or Subway in the past week. In bivariate analyses, neither child demographics nor parent socioeconomic characteristics were significantly associated with consumption of something to eat or drink from McDonald's or other FF restaurants in the past week (Table 2). However, parental FF consumption was strongly associated with an increased likelihood of children eating at McDonald's and the other FF restaurants. The children of parents who were influenced by their child liking FF restaurant toys were 1.44 (95% CI=1.06, 1.96) times more likely to have eaten at McDonald's; the risk ratio for other FF restaurants was similar in magnitude but was not statistically significant. Children who usually knew what toys FF restaurants

offered were 1.64 (95% CI=1.17, 2.29) times more likely to have eaten at McDonald's in the past week (Table 2). We found no evidence of this association for the other FF restaurants offering CPTI toy premiums (RR=0.99; 95% CI=0.63, 1.56).

The association between knowledge of FF toys and eating at McDonald's remained significant after adjustment for child demographics and parent socioeconomic characteristics (RR=1.64; 95% CI=1.26, 2.14) (Table 3). Although slightly attenuated, children were still 38% (RR=1.38; 95% CI=1.04, 1.82) more likely to have consumed McDonald's in the past week if they knew what toys were offered by FF restaurants, even after adjusting for parent FF consumption and parents being influenced by their child's liking of FF toys. Using the same models, we did not find a statistically significant association between children's knowledge of FF toys and having eaten at one of the other three restaurants in the past week. However, parent FF consumption and parent report that their child liking the FF toys influences their FF visits were both independently associated with child consumption of Burger King/Subway/Wendy's (RR=1.34; 95% CI=1.20, 1.48; RR=1.42, 95% CI=1.02, 1.98; respectively).

We conducted secondary analyses adjusting for the potential overlap between FF restaurants at which children ate (i.e., adding Burger King/Subway/Wendy's consumption to the McDonald's model, and vice versa). These covariates were not significant, and the addition of these variables to the models did not substantially change the results. In post-hoc analyses, we also examined whether children's screen time (measured two ways: average hours of TV watching per week; and number of kids' channels with FF advertising watched in the past 7 days) impacted the relationship between children's knowledge of CPTI toys and their FF consumption at McDonald's or at Burger King/Subway/Wendy's. In none of the additional models was the RR for children's toy knowledge reduced substantially.

Discussion

We enrolled a cross-sectional, community-based sample of parents to examine the influence of toy knowledge on young children's FF intake in a natural setting. Our study results showed that children's knowledge of FF toys was significantly associated with a greater likelihood of eating at McDonald's. Our data indicated McDonald's restaurants released CPTI toy premiums with kids' meals three times more frequently than other FF restaurants. Further, every toy released was associated with a highly popular CPTI and offered in collectible, often "gendered" series. For example, McDonald's Happy Meal promotions in March 2013 included a series of six "The Croods" toys (timed with the movie release); nine "Skylanders: Giants" toys (targeting boys); and six "Fijit Friends Shimmies" dancing pet figurines (targeting girls). Our results also indicated that children who knew about FF toys were most likely to find out about them through TV advertising. Compared to other FF restaurants, McDonald's is the most frequent advertiser to young children on TV, and most of their child-targeted advertisements focus on the CPTI toy premiums (Bernhardt *et al.*, 2013; Harris *et al.*, 2013).

Our findings are supported by prior experimental evidence indicating that children's requests increase when a product is marketed with a CPTI character or premium, and that

children are powerfully motivated by collectible toys (Keller et al., 2012; Kraak & Story, 2015a; McAlister, 2012; Otten, 2014). In a national survey of parents of preschool-age children, 40% reported that their child asked at least once a week to be taken to McDonald's, and 15% said their child asked every day (Harris *et al.*, 2010). In light of these findings, it is conceivable that children's knowledge of FF toys, which arises in part from advertising exposure, may prompt requests to go to McDonald's. This premise is supported by our fully adjusted model, which indicates that the association between children's knowledge of FF toys and their consumption of McDonald's is partially mediated by parents being influenced by their child liking of FF toys. Additionally, it also may be the case that the presence of playgrounds, low price incentives, or other restaurant characteristics not related to the kids' meal may motivate visits to McDonald's.

We did not detect a significant association between toy knowledge and children's consumption of food from other FF restaurants that offered CPTI toy premiums. There are several possible reasons for this finding. Although the other three FF restaurants rank in the top 10 quick-serve restaurant chains with respect to sales (QSR Magazine, 2015), their child-targeted advertising is substantially less than McDonald's (Harris *et al.*, 2012). For example, Burger King did not air any television commercials on children's channels during our data collection period (Adscope; Kantar Media, U.S.). Compared to McDonald's, these restaurants each released many fewer toy premiums and there were also notable qualitative differences between toys they did release. For example, Subway's CPTI "toy" premiums were reusable meal bags or backpacks -- which may be less appealing to young children -- and none of Wendy's toys were linked to movies. These findings may support the premise that McDonald's toy premiums are most appealing to children because their toys are consistently associated with favorite media characters (Kraak & Story, 2015a). Nonetheless, because the lower frequency of consumption at these restaurants precluded us from examining them independently, these results should be interpreted cautiously as the effects for these restaurants may be heterogeneous.

In this study, almost half the children between 3–5 years of age ate at one or more of the FF restaurants offering CPTI toy premiums in the past week, and one-third ate at McDonald's. McDonald's consumption was nearly identical regardless of child gender, age, race (white/non-white), or household income, which supports the ubiquitous appeal of McDonald's to children. In light of research linking frequent FF consumption with increased total intake of energy, fat, saturated fat, and sugar (Powell & Nguyen, 2013), as well as higher BMI (Braithwaite *et al.*, 2014) the high rate of FF consumption in this sample of young children is concerning.

Surprisingly, only 15.8% of parents reported that their child usually knew what toys were being offered at FF restaurants. Although it is possible that parents underestimate or are unaware of children's toy knowledge, it is also possible that just knowing a FF restaurant consistently offers new CPTI toy premiums, without knowledge of the specific toys, drives visits to FF restaurants. Other studies have found mothers of young children indicate the toy as the primary reason for going to a FF restaurant (Henry & Borzekowski, 2015). This could explain why we found toy knowledge effects for McDonald's but not the other FF restaurants, since McDonald's offers new toys much more frequently. Additionally,

McDonald's offers the most toys with links to favorite CPTI media characters (e.g., Batman, Despicable Me Minions, Angry Birds). In light of literature supporting the powerful relationships children form with media characters (Kraak & Story, 2015a), this could also explain the association between children's toy knowledge and consumption of McDonald's versus the other FF restaurants. Over a quarter of parents reported that their decision to get FF is influenced by their child liking FF toys and this was a significant predictor of eating at the other FF restaurants. Even if the toys offered by the other FF restaurants were not as appealing or advertised as frequently to children, it is still possible that they were an effective marketing strategy via parents who are motivated to take their child to a restaurant where any toy is offered.

This study utilized a cross-sectional survey, which limits causal inference. Our survey questions were worded in a way to capture children's general knowledge of toys before they went to the FF restaurant, but it is possible that children only learned about toy promotions after going to McDonald's for another reason. However, 50% of the parents whose children know about the toys said their children learned about them from watching TV, which suggests that children's toy knowledge precedes their visit to FF restaurants. In post-hoc analyses, adding separate variables for children's screen time did not substantially change the relationship between children's toy knowledge and their FF consumption. However, our screen time variables may not have been sensitive enough to impact these relationships. Longitudinal study designs which can account for the temporality of FF CPTI toy releases and children's FF visits are warranted to tease apart the mechanisms driving children's consumption of FF. For example, whether children were motivated by the toys themselves, or because they adore the media character linked to the toy, is an open question. Our sample was diverse in terms of socioeconomic status, and our rates of FF intake were comparable to national samples (Powell & Nguyen, 2013; Powell *et al.*, 2012). However, replication in highly urban settings with greater access to FF, as well as with samples characterized by greater racial and ethnic diversity, may be important (Fraser, Edwards, Cade, & Clark, 2012; Bodor, Rice, Farley, Swalm, & Rose, 2010). The study population included 3–5 year olds because this is the developmental time period when food preferences and dietary practices are established, and also because this age range represents the earliest target for food marketers. However, future work should also examine the impact of toy premiums on older children, particularly because some of the premiums we noted (e.g., Subway backpacks) may be more appealing to an older age group. We assessed children's frequency of FF intake through a 7-day recall with parents as proxy. We do not know whether children ordered kids' meals with toys at the FF restaurants, and did not collect data on what foods or beverage were ordered or consumed by children. This is also an important direction for future research, since it could explain the difference in findings between McDonald's and the other FF restaurants.

National (Healthy Eating Research, 2015) and international (World Health Organization [WHO], 2012) public health efforts have urged regulations and limitations on FF marketing to young children. Some progress has been made internationally, both with regard to limited television marketing of FF during children's programming (e.g., in Sweden, Norway, and the United Kingdom), and with attempts to ban the distribution of toy premiums in kids' FF

meals (e.g., Chile) (“Chile bans marketing”, 2012; WHO, 2012). However, success in the U.S. has been minimal. Santa Clara and San Francisco counties in California implemented ordinances requiring FF meals paired with toys to meet minimum nutrition guidelines (Otten *et al.*, 2014), and similar legislation has been proposed in New York (Kallos, 2014). Simulation research examining the potential impact of such ordinances suggests they could substantially reduce child weight gain (Freij, Sell, Bozack, Weiss, & Garcia, 2014). Nevertheless, these ordinances are controversial, and are unlikely to pass without further scientific evidence demonstrating the impact of FF CPTIs on children’s diet, including epidemiological studies such as this (Etow, 2012).

Conclusions

Increasingly, public health researchers offer recommendations for the responsible marketing of fast food to children. For example, Otten (2014) suggests that restaurants should only distribute toy premiums with kids’ meals that meet stringent nutrition criteria. Similarly, Kraak & Story (2015b) encourage entertainment companies to allow the use of their cartoon mascots and media characters solely for the promotion of healthy foods. Others advocate for the application of responsible marketing principles to brands, and not just products, particularly if the brand itself is being marketed to children and offers other foods of low nutritional value (Healthy Eating Research, 2015). These recommendations are based on the assumption that the toys are influencing children to consume fast food. Our data, although cross-sectional, provide empirical support for these assumptions. Our study extends previous experimental research by demonstrating in a community sample that young children’s knowledge of FF toys is associated with a greater frequency of eating at McDonald’s. These findings provide additional support in favor of regulating the food industry’s use of CPTI toy premiums to market foods that are energy dense or of low nutritional value to children.

Acknowledgments

Financial Support: This study was supported by the National Institutes of Health, grant number R01HD071021. The National Institutes of Health had no role in the design, analysis or writing of this article.

References

- Azur M, Stuart E, Frangakis C, Leaf P. Multiple imputation by chained equations: What is it and how does it work? *International Journal of Methods in Psychiatric Research*. 2011; 20(1):40–49.10.1002/mpr.329 [PubMed: 21499542]
- Bernhardt AM, Wilking C, Adachi-Mejia AM, Bergamini E, Marijnissen J, Sargent JD. How television fast food marketing aimed at children compares with adult advertisements. *PloS One*. 2013; 8(8):e72479.10.1371/journal.pone.0072479 [PubMed: 24015250]
- Bodor JN, Rice JC, Farley TA, Swalm CM, Rose D. The association between obesity and urban food environments. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. 2010; 87(5):771–781.10.1007/s11524-010-9460-6 [PubMed: 20458548]
- Borzekowski DL, Robinson TN. The 30-second effect: An experiment revealing the impact of television commercials on food preferences of preschoolers. *Journal of the American Dietetic Association*. 2001; 101(1):42–46.10.1016/S0002-8223(01)00012-8 [PubMed: 11209583]
- Bowman SA, Gortmaker SL, Ebbeling CB, Pereira MA, Ludwig DS. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics*. 2004; 113(1 Pt 1):112–118. [PubMed: 14702458]

- Braithwaite I, Stewart AW, Hancox RJ, Beasley R, Murphy R, Mitchell EA. ISAAC Phase Three Study Group. Fast-food consumption and body mass index in children and adolescents: An international cross-sectional study. *BMJ Open*. 2014; 4(12):e005813-2014-005813.10.1136/bmjopen-2014-005813
- Chernin A. The effects of food marketing on children's preferences: Testing the moderating roles of age and gender. *The Annals of the American Academy of Political and Social Science*. 2008; 615(1):101–118.10.1177/0002716207308952
- Chile bans marketing of toys in children's food. *Cnsnews.com*; 2012 Aug 1. Retrieved from: <http://cnsnews.com/news/article/chile-bans-marketing-toys-childrens-food>
- Connor SM. Food-related advertising on preschool television: Building brand recognition in young viewers. *Pediatrics*. 2006; 118(4):1478–1485.10.1542/peds.2005-2837 [PubMed: 17015538]
- De Droog SM, Valkenburg PM, Buijzen M. Using brand characters to promote young children's liking of and purchase requests for fruit. *Journal of Health Communication*. 2011; 16(1):79–89.10.1080/10810730.2010.529487 [PubMed: 21058143]
- Etow A. No toy for you! The healthy food incentives ordinance: Paternalism or consumer protection? *American University Law Review*. 2012; 61(5):1503–1542. [PubMed: 25335198]
- Federal Trade Commission. A review of food marketing to children and adolescents: Follow up report. 2012 Dec. Retrieved from: <https://www.ftc.gov/sites/default/files/documents/reports/review-food-marketing-children-and-adolescents-follow-report/121221foodmarketingreport.pdf>
- Fraser LK, Edwards KL, Cade J, Clarke GP. The geography of fast food outlets: A review. *International Journal of Environmental Research and Public Health*. 2010; 7(5):2290–2308.10.3390/ijerph7052290 [PubMed: 20623025]
- Freij MY, Sell RL, Bozack AK, Weiss LJ, Garcia AC. Modeling potential effects of reduced calories in kids' meals with toy giveaways. *Childhood Obesity*. 2014; 10(1):58–63.10.1089/chi.2013.0082 [PubMed: 24304430]
- Harris, J.; Schwartz, M.; Brownell, K.; Sarda, V.; Ustjanauskas, A.; Javadizadeh, J.; Ohri-Vachaspati, P. *Fast food FACTS: Evaluating nutrition marketing to youth*. New Haven, CT: Yale Rudd Center for Food Policy & Obesity; 2010.
- Harris, J.; Schwartz, M.; Munsell, C.; Dembek, C.; Liu, S.; LoDolce, M.; Kidd, B. *Fast food FACTS 2013: Measuring progress in nutrition and marketing to children and teens*. New Haven, CT: Yale Rudd Center for Food Policy & Obesity; 2013.
- Hastings, G.; McDermott, L.; Angus, K.; Stead, M.; Thomson, S. *The extent, nature, and effects of food promotion to children: A review of the evidence*. Geneva, Switzerland: World Health Organization; 2006.
- Healthy Eating Research. *Recommendations for responsible food marketing to children*. Minneapolis, MN: Healthy Eating Research; 2015.
- Henry HK, Borzekowski DL. Well, that's what came with it. A qualitative study of U.S. mothers' perceptions of healthier default options for children's meals at fast-food restaurants. *Appetite*. 2015; 87:108–115.10.1016/j.appet.2014.12.201 [PubMed: 25529818]
- Huber, P. *The behavior of maximum likelihood estimates under nonstandard conditions*. Berkeley, CA: University of California Press; 1967.
- IMDb. *Movies, TV, and Showtimes*. 2015. www.imdb.com Retrieved March 11, 2015
- Institute of Medicine. *Food marketing to children and youth: Threat or opportunity*. Washington, DC: Institute of Medicine of the National Academies; 2005.
- Jenkin G, Madhvan N, Signal L, Bowers S. A systematic review of persuasive marketing techniques to promote food to children on television. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*. 2014; 15(4):281–293.10.1111/obr.12141 [PubMed: 24433359]
- Kallos, B. "Healthy happy meals" bill to be introduced in NYC. NYC Council Member BJ Kallos, District 5. 2014. Retrieved from: <http://benkallos.com/press-release/%E2%80%9CHealthy-happy-meals%E2%80%9D-bill-be-introduced-nyc>
- Keller KL, Kuilema LG, Lee N, Yoon J, Mascaro B, Combes AL, Halford JC. The impact of food branding on children's eating behavior and obesity. *Physiology & Behavior*. 2012; 106(3):379–386.10.1016/j.physbeh.2012.03.011 [PubMed: 22450261]

- Kotler JA, Schiffman JM, Hanson KG. The influence of media characters on children's food choices. *Journal of Health Communication*. 2012; 17(8):886–898.10.1080/10810730.2011.650822 [PubMed: 22475307]
- Kraak VI, Story M. Influence of food companies' brand mascots and entertainment companies' cartoon media characters on children's diet and health: A systematic review and research needs. *Obesity Reviews*. 2015a; 16(2):107–126.10.1111/obr.12237 [PubMed: 25516352]
- Kraak VI, Story M. An accountability evaluation for the industry's responsible use of brand mascots and licensed media characters to market a healthy diet to American children. *Obesity Reviews*. 2015b; 16(6):433–453.10.1111/obr.12279 [PubMed: 25875469]
- Letona P, Chacon V, Roberto C, Barnoya J. Effects of licensed characters on children's taste and snack preferences in Guatemala, a low/middle income country. *International Journal of Obesity*. 2014; 38(11):1466–1469.10.1038/ijo.2014.38 [PubMed: 24583854]
- McAlister ARCT. Collectible toys as marketing tools: Understanding preschool children's responses to foods paired with premiums. *Journal of Public Policy and Marketing*. 2012; 31(2):195–205. <http://dx.doi.org/10.1509/jppm.10.067>.
- McAlister AR, Cornwell TB, Cornain EK. Collectible toys and decisions to share: I will gift you one to expand my set. *The British Journal of Developmental Psychology*. 2011; 29(Pt 1):1–17.10.1348/026151010X526353 [PubMed: 21288252]
- Otten, JJ. Food marketing: Using toys to market children's meals. Minneapolis, MN: Healthy Eating Research; 2014. Retrieved from: <http://www.healthyeatingresearch.org>
- Otten JJ, Saelens BE, Kapphahn KI, Hekler EB, Buman MP, Goldstein BA, King AC. Impact of San Francisco's toy ordinance on restaurants and children's food purchases, 2011–2012. *Preventing Chronic Disease*. 2014; 11:E122.10.5888/pcd11.140026 [PubMed: 25032837]
- Powell LM, Nguyen BT. Fast-food and full-service restaurant consumption among children and adolescents: Effect on energy, beverage, and nutrient intake. *JAMA Pediatrics*. 2013; 167(1):14–20.10.1001/jamapediatrics.2013.417 [PubMed: 23128151]
- Powell LM, Nguyen BT, Han E. Energy intake from restaurants: Demographics and socioeconomic, 2003–2008. *American Journal of Preventive Medicine*. 2012; 43(5):498–504.10.1016/j.amepre.2012.07.041 [PubMed: 23079172]
- QSR Magazine. The QSR 50. 2015. Retrieved from: www.qsrmagazine.com/reports/qsr50-2014-top-50-chart
- Roberto CA, Baik J, Harris JL, Brownell KD. Influence of licensed characters on children's taste and snack preferences. *Pediatrics*. 2010; 126(1):88–93.10.1542/peds.2009-3433 [PubMed: 20566614]
- Robinson TN, Borzekowski DL, Matheson DM, Kraemer HC. Effects of fast food branding on young children's taste preferences. *Archives of Pediatrics & Adolescent Medicine*. 2007; 161(8):792–797.10.1001/archpedi.161.8.792 [PubMed: 17679662]
- Stoneman Z, Brody G. The impact of child-oriented advertisements on mother-child interactions. *Journal of Applied Developmental Psychology*. 1981; 2(4):369–376.
- U.S. Census Bureau. State and Country QuickFacts. 2015. Retrieved from: <http://quickfacts.census.gov/qfd/states/33000.html>
- World Health Organization. Marketing of foods high in fat, salt and sugar to children: Updated 2012–2013. Geneva, Switzerland: World Health Organization; 2013. Retrieved from: http://www.euro.who.int/__data/assets/pdf_file/0019/191125/e96859.pdf?ua=1
- Zou G. A modified poisson regression approach to prospective studies with binary data. *American Journal of Epidemiology*. 2004; 159:702–706.10.1093/aje/kwh090 [PubMed: 15033648]

Highlights

- Half of 3–5 year olds ate fast food in the past 7 days; one-third ate at McDonalds.
- Children’s knowledge of toy premiums was associated with eating at McDonalds.
- Toy knowledge was not associated with eating at other fast food restaurants.

Figure 1.
Distribution of cross-promotional tie-in toy premiums by type at fast food restaurants.
Note: “Other” CPTIs included books, accessories, and theme park promotional toys.

Figure 2.
Parent report of how the child finds out about toys or giveaways at fast food restaurants (n=90).

Table 1

Fast Food Restaurant Cross-Promotional Tie-In Toy Premiums released between April 2013–March 2014

McDonald's	Burger King	Subway	Wendy's
The Croods building block and launcher toys	Cut the Rope: Time Travel Om	Phineas and Ferb	I SPY™ games
Skylanders: Giants toy action figures	Nom toys	reusable bags	Klutz Trip-tivities
Fijit Friends® Shimmies dancing pet figurines	Jurassic Park dinosaur toys	Iron Man 3 reusable	activity books
Spy Gear toys	The Jungle Book keychain toys	bags	SeaWorld® toys
Winx Club fairy figurines	Care Bears™ craft figurines	Monsters University	Guinness World
Epic motion toys	Beyblade action toys	backpacks	Records toys
Twinkle Toes by Skechers keychains	The Simpsons™ Super Heroes	Gravity Falls reusable	Scared Shrekless toys
Hot Wheels cars	toys	bags	Toys R Us® surprise
Despicable Me 2 toy figurines	Polly Pocket™ light up backpack	Cloudy with a Chance	toys
The Smurfs 2 toy figurines	clips	of Meatballs 2 reusable	Hasbro® Game Night
Power Rangers Megaforce buildable action figures	Matchbox® car and truck toys	bags	mini- games
Justice® stickers, notes and locker accessories	Pac-Man™ and the Ghostly	Disney's Frozen tote	Cranium® Brain Breaks
Batman action figures	Adventures toys	bags	games
Wizard of Oz 75 th Anniversary collectible figurines	Ice Age™ toys	Muppets Most Wanted	
Angry Birds Star Wars Halloween candy pails		backpacks	
Monster High Halloween candy pails			
Happy Meal collectible books			
NFL Rush Zone figurines			
Build-A-Bear Workshop® stuffed animals			
Furby BOOM! figurines			
Adventure Time action figures			
Paul Frank toys and accessories			
The Lego Movie® action cups			
Mr. Peabody & Sherman bobble heads and games			

Table 2

Demographic Frequencies and Probability of Eating at Fast Food Restaurants

	N	Child Ate at McDonald's in Past Week Row %	RR (95% CI)	Child Ate at Burger King, Subway or Wendy's in Past Week Row %	RR (95% CI)
Total	583	33.9		24.3	
Child Characteristics					
Sex					
Girl	302	33.3	Reference	20.6	Reference
Boy	281	34.4	1.03 (0.78,1.37)	28.3	1.37 (0.98,1.92)
Age (years)					
3	210	33.5	Reference	25.8	Reference
4	217	33.5	1.00 (0.72,1.40)	25.0	0.97 (0.66,1.43)
5	154	34.7	1.04 (0.72,1.49)	20.3	0.79 (0.50,1.24)
Race					
Not White	150	35.4	Reference	31.0	Reference
White	404	32.7	0.92 (0.67,1.28)	22.0	0.71 (0.49,1.02)
Parent Characteristics					
Household Income					
\$25,000	156	35.5	Reference	27.6	Reference
\$25,001 – \$50,000	129	29.9	0.84 (0.56,1.28)	24.6	0.89 (0.56,1.42)
\$50,001 – \$100,000	162	36.4	1.02 (0.70,1.49)	21.4	0.78 (0.49,1.22)
\$100,000	100	31.3	0.88 (0.57,1.37)	22.2	0.80 (0.48,1.35)
Parent Education					
High School Diploma or Less	271	36.1	Reference	24.9	Reference
Associates or Tech Degree	116	33.3	0.92 (0.63,1.34)	27.2	1.09 (0.71,1.68)
Bachelor's or Graduate Degree	173	30.1	0.83 (0.59,1.17)	21.6	0.87 (0.58,1.30)
Parent Fast Food Consumption					
Never	56	9.4	Reference	7.5	Reference
Less than once a month	178	22.7	2.40 (0.95,6.10)	17.3	2.30 (0.81,6.52)
Less than once a week	154	37.6	3.98 (1.60,9.95)	22.4	2.97 (1.05,8.40)
1–2 times a week	132	46.9	4.97 (2.00,12.37)	40.6	5.38 (1.95,14.88)

	N	Child Ate at McDonald's in Past Week Row %	RR (95% CI)	Child Ate at Burger King, Subway or Wendy's in Past Week Row %	RR (95% CI)
3 or more times a week	49	55.1	5.84 (2.25,15.17)	34.7	4.60 (1.55,13.66)
Child Liking Toy Influenced Parent's Decision to go to Fast Food Restaurant					
No	387	29.9	Reference	21.7	Reference
Yes	146	43.1	1.44 (1.06,1.96)	29.4	1.35 (0.93,1.96)
Fast Food Toy Knowledge					
Child Usually Knows What Toys Are Offered by Fast Food Restaurants					
No	480	30.9	Reference	24.7	Reference
Yes	90	50.6	1.64 (1.17,2.29)	24.4	0.99 (0.63,1.56)

Note: Subgroup frequencies do not always add up to total because of missing data. Risk ratios for McDonald's and other FF restaurants are not directly comparable because the baseline risks differ. RR = Risk Ratio; 95% CI = 95% Confidence Interval. Significant risk ratios are indicated in bold.

Table 3

Adjusted Risk Ratio of Child having Eaten at Fast Food Restaurants in Past Week (n=583)

	Child Ate at McDonald's in Past Week		Child Ate at Burger King, Subway or Wendy's in Past Week	
	Adjusted for Demographic and Socioeconomic characteristics	Adjusted for Demographics, Socioeconomics, Parent FF Consumption, and Child Liking Toy	Adjusted for Demographic and Socioeconomic characteristics	Adjusted for Demographics, Socioeconomics, Parent FF Consumption, and Child Liking Toy
Child Usually Knows What Toys Are Offered by Fast Food Restaurants	1.64 (1.26,2.14)	1.38 (1.04,1.82)	0.95 (0.63,1.42)	0.75 (0.48,1.17)
Parent Fast Food Consumption		1.33 (1.23,1.45)		1.34 (1.20,1.48)
Child Liking Toy Influenced Parent's Decision to go to Fast Food Restaurant		1.25 (0.96,1.62)		1.42 (1.02,1.98)

Note: Risk ratios and 95% Confidence Intervals are presented; significant results are indicated in bold. All analyses are adjusted for child sex, age, and race (white/nonwhite); household income and parent education.