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Pairing Animal Cartoon Characters With Produce Stimulates Selection Among Child Zoo Visitors

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Abstract

In order to address the pervasive trend of underconsumption of fruits and vegetables among children, we examined the hypothesis that children would be more likely to select fruits (apple slices, bananas, and oranges) and vegetables (baby carrots) when paired with animal cartoon image than when available without the character image. Tested in a randomized experiment using counterbalancing, products were arranged on two tables at two separate family fun nights held at a local zoo. Animal character produce pairings were manipulated by placing one of two animals (tamarin or iguana) next to two of the four fruit or vegetable selections at each table, and by changing when available without the image. In total, 755 produce selections were made. Significantly more products paired with a character were selected (62.38%) than the same products, not paired (37.62%), $\chi^2 = 46.32$, $df = 1$, $p < .001$. The odds ratio of the treatment versus control was 1.66 (i.e., 471/284), indicating that children were 66% more likely to select a snack when paired with an animal cartoon. Study findings highlight the positive impact of animal cartoons on children's fruit and vegetable snack selections, and results suggest the potential for using animal cartoons to encourage fruit and vegetable selection for children.

Keywords

community health; diet; food retail; health communications; health promotion; interdisciplinary; new media and social media interventions; obesity; social marketing

Obesity affects 17% of children aged 2 to 19 in the United States (Ogden, Carroll, Kit, & Flegal, 2014). U.S. children's diets are heavily supported by meals and snacks high in fat, sodium, and refined carbohydrates while also lacking an adequate intake of fruits and vegetables (S. A. Kim et al., 2014). Between 2007 and 2010, 60% of children aged 1 to 18 years did not meet the U.S. Department of Agriculture (USDA) Food Patterns fruit intake recommendations, and 93% did not meet vegetable recommendations (S. A. Kim et al.,

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2014). While the exact cause is unclear, industry-driven food marketing efforts aimed directly at children to buy unhealthy food products amounted to \$1.8 billion in expenditures in 2009 alone (Kraak & Story, 2015). Half of these dollars use cross-promotion advertising with media character merchandising and tie-ins with movies, television programs, video games, and social media (e.g., SpongeBob SquarePants brand Cereal; Kraak & Story, 2015). Companies pay a premium in the effort to also reach children in their local communities, in stores, restaurants, schools, and anywhere else children spend time (Harris, Brownell, & Bargh, 2009; Harris & Graff, 2011).

The connection between corporate marketing efforts and public health marketing efforts, however, is new and developing (Harris et al., 2009; Kraak & Story, 2010). The present study, which examines how effective pairing an animal cartoon with produce is as a way to promote fruit and vegetable selection among children, is developed in a new public health context that seeks better alignment between corporate marketing approaches and public health interests (Stitt & Kunkel, 2008; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). This emerging area of research (Hanks, Just, & Brumberg, 2016) is embedded in both the ecological approach to health promotion, which emphasizes the role of the environment on decisions, as well as behavioral economics, and the study fills a needed gap in the literature about how innovative partnerships and marketing strategies may serve to advance our knowledge of approaches to public health education and social marketing.

The application of animals and animal-like characters to advertise global brands like Cheetos, Frosted Flakes, and Coca Cola is a common, long-standing food marketing technique. According to a recent *New Yorker* article, of 1,151 brand characters used by industry advertising, more than half were animals (Frazier, 2014).

Animals are particularly enticing for kids. Across centuries, researchers have documented the unique relationship that children often have with animals (Melson, 2001). Study results show that children have an intuitive grasp on the reality that humans are animals and recognize that people have characteristics and tendencies similar to animals (Melson, 2001). One study of 7- and 10-year-olds found that pet-owning children were as likely to talk to their pets as with their siblings about an experience they went through (Melson, 2001).

While the snack food industry has utilized animals in promotional campaigns targeted to children for some time, fruit and vegetable marketing efforts led by public health advocates have instead traditionally been more focused on educational approaches about the risk factors of unhealthy eating (Pivonka, Seymour, McKenna, Baxter, & Williams, 2011). Such approaches are congruent with data that even small children are aware of the differences between healthy and unhealthy food (Sigman-Grant et al., 2014).

Only recently has produce promotion taken a more coordinated and mass-merchandizing approach that includes tactics akin to those in the snack food industry (Hanks et al., 2016; Tal & Wansink, 2015). Public health efforts are now helping to shift consumer behavior with small, subtle “nudges” toward healthier options, which have shown promise (Campbell-Arvai, Arvai, & Kalof, 2014; Sobal & Wansink, 2007) and have been supported by the USDA and other health advocacy organizations (Guthrie, Mancino, Wansink, & Just, 2011).

Such “nudges” in places like the school cafeteria have included giving food products playful names that will appeal to children, displaying branded vegetable characters to improve appeal, placing healthier products within easier reach, and displaying produce in bowls to encourage sampling (Hanks et al., 2016; Hanks, Just, & Wansink, 2013).

Moreover, there is increasing evidence of a growing collaboration between industry, government, and academic sectors in order to provide more ethical and health-conscious product offerings and marketing. In 2012, for example, Birds Eye announced an agreement with Partnership for a Healthier America to spend at least \$2 million annually on marketing and advertising that encourages children to eat vegetables (Newman, 2012). Marketers incorporated the characters from a popular Nickelodeon television show, *iCarly*, to promote vegetable consumption. In 2014, the Produce Marketing Association announced efforts to launch an “Eat Brighter!” campaign, which features the Sesame Street characters to promote eating vegetables to an audience of young children (Kraak & Story, 2015). One year later, more than 50 produce growers and retailers adopted this campaign, featuring the characters of Sesame Street on product packaging and around their store or market (Miterko, 2015). Early evidence of the “Eat Brighter!” campaign success suggests that such approaches hold promise for improving consumption of fruits and vegetables among children: it was found that when the Sesame Street character Elmo promotes broccoli, children’s interest in eating broccoli compared to chocolate more than doubled (Kotler, Schiffman, & Hanson, 2012). In 2015, Partnership for a Healthier America also introduced a marketing approach and brand called “FNV,” which stands for “fruits and vegetables” where celebrities promote fruits and vegetables (Hatt, 2015).

The present study sought to understand, using an experimental framework, whether pairing illustrated animal cartoon characters called *Tastimals* (Figure 1) with produce items would stimulate more children to select the fruits and vegetables. Our approach is grounded in behavioral economic theory, which asserts that it is possible to steer people toward better decisions by presenting choices in novel ways (Liu, Wisdom, Roberto, Liu, & Ubel, 2014). We tested the hypothesis that children would be more likely to select fruits (apple slices, bananas, and oranges) and vegetables (baby carrots) if they are paired with a cartoon-like animal character image. A secondary goal was to assess the acceptability of the *Tastimals* among the target audience by soliciting initial reactions and feedback from children about the “likeability” of the characters with a short survey.

Method

Animal Selection and Character Development

In order to identify appropriate animals for *Tastimal* characters, project partners at the Brandywine Zoo (Wilmington, DE) provided a list of common zoo animals that are omnivores or herbivores, which included Two-Toed Sloth, Golden Lion Tamarin, Degu, Red Panda, Flemish Giant Rabbit, Chinchilla, African Pygmy Goat, Capybara, Prehensile-tailed Porcupine, Green Iguana, Eastern Box Turtle, and Llama. Only omnivores or herbivores were considered to show children that fruits and vegetables are an important part of these animals’ diets. Further examination of animals in comparison to other local and regional zoos helped identify animals most commonly present. Ultimately, two animals were selected

by the team for further development: a golden lion tamarin and a green iguana. Animals and images were then provided to a local graphic designer who developed the animals into cartoon characters. The iguana was provided with longer eyelashes as a way of assigning it moderately more feminine qualities. The animals were designed in a cartoon manner to replicate similar animation used in childhood marketing advertisements (e.g., Tony the Tiger and Bugs Bunny); genders were arbitrarily assigned to the characters.

Experimental Testing

Research was performed at two distinct “Family Fun Night” events hosted by the zoo in June and July of 2015 to examine children’s preferences for items when paired with the *Tastimal* animal versus when not paired. Because of the low entrance fee of \$1, Family Fun Nights are well attended by local Wilmington residents in addition to members of the zoo, which provided a demographically diverse opportunity to test the concept. As of 2010, the population in the city of Wilmington was composed of 58% African American, 32% Caucasian, and 1% Asian residents. In the years between 2010 and 2014, the mean yearly household income was just under \$39,000, and 26% of residents were living in poverty (U.S. Census Bureau, 2015).

As children accompanied by an adult entered the zoo, they were handed two distinct colored tickets for each child to redeem at each of two *Tastimals* tables. Colored tickets were used to support participation at both locations whereby only one color ticket was good at one table (located at the front of the zoo) and the other color at the other table located at the back of the zoo. Parents were told that there were two snack tables at the zoo where children could select one snack at each table using their ticket. At each table, children were asked by research associates “what snack would you like?” and then provided their ticket, which corresponded to the table where they received the snack (green or red). After the child selected the produce option they wanted in exchange for their ticket, the research associate inserted the ticket into prelabeled buckets for each produce item.

All eight research associates completed required CITI human subjects training provided by the university. Furthermore, associates were provided with a 30-minute on-site training prior to the start of the event where exact wording (and the only wording) to be used at the snack table (i.e., what snack would you like?) was practiced. The process for handing tickets to children accompanied by adults entering the zoo was also reviewed along with basic instructions for responding to any inquiries. Research associates varied in their familiarity with the study, though most understood that the purpose was to test animal associations with produce.

Each table was equipped with the same four produce “snack” options: pre-bagged apple slices, bananas, oranges, and pre-bagged baby carrots. The fruits and vegetables were chosen based on what options could comply best with standardized food safety practices (i.e., could be prepackaged or had a disposable peel) and the cooperating grocery stores’ availability to provide large quantities of the products.

In addition, each table arrangement included two posters, one of each of the tested cartoon *tastimal* animals. Each poster featured a *tastimal* animal, its name, some facts about its

lifestyle, and a picture of one of the four possible fruit or vegetable snacks. Posters were discretely taped to a folding chair for display next to the table. The animal cartoon and food combinations varied by table and were counterbalanced such that each produce item available was at one time paired with both animal cartoons, and at another time left without a pairing. Furthermore, the pairing combinations on the table changed between the first and second Family Fun Nights so that no combination was duplicated. Example table organization and combination shown in Figure 2.

Surveys included five questions and were offered to children with no incentive. Available responses utilized the hedonic scale of a sad, indifferent, or happy face and were scored in a Likert-type scale as follows: 1 = *sad*, 2 = *indifferent*, 3 = *happy*. The institutional review board of the University of Delaware approved the survey approach (Protocol Number 782475-1).

Data Analysis

There were two groups in the primary investigation: snacks paired with animal cartoons (treatment group) and snacks not paired with animal cartoons (control group). The dependent variable was the total number of selections (tickets redeemed) during the two Family Fun Nights. A chi-square test was first conducted to investigate if the two groups are different with respect to the total number of selection. A series of log-linear models were used in order to test the significance of potential confounding or moderating factors such as the type of snack to be paired with an animal cartoon, the type of animal cartoon to be paired with snacks, or the combination of the two, as well as the table location. All analyses were done using the software program SAS (Statistical Analysis System, Version 9.4).

Results

In total, 755 produce selections were made. There were 479 items selected during the first Family Fun Night and 276 selected at the second, when rain was present in the forecast. During the first round of testing in June 2015, staff at the table closer to the entrance provided 242 total produce items to the participants, while the second table located toward the back of the zoo received 237 visitors (see Table 1). During Round 2 in July 2015 (with forecasted rain), the first table received 175 visitors and the second table received 101. Summary statistics for selection frequency for combinations of snacks and animal cartoons are provided in Table 2.

The count of children's selections not paired with a *Tastimal* was 284 and the count that were paired was 471. Analysis of these counts identified that 62.38% of these selections children made were for products that were paired with a *Tastimal* animal while only 37.62% of snacks were chosen when they had no character association. Differences in the probabilities between selecting a snack paired with a *Tastimal* animal (treatment group) and snack selection absent of the *Tastimal* animal cartoon association (control group) were significant ($\chi^2 = 46.32$, $df = 1$, $p < .001$). The Cramer's V was .25, representing a medium effect size (Rea & Parker, 1992). The odds ratio of the treatment versus control was 1.66 (i.e., 471/284), indicating that children were 66% more likely to select a snack when paired with a *Tastimal* animal cartoon.

The log-linear model (Table 3) examining the interaction between the treatment and the type of snack reveals that such an interaction was not significant ($\chi^2 = 5.00$, $df = 2$, $p = .172$). This suggests that the significant effect of the treatment, that is, pairing a snack with a *Tastimal* animal, was not moderated by the type of snack being paired. Similarly, the interaction between the treatment and the table location was not significant ($\chi^2 = .60$, $df = 1$, $p = .437$), indicating that table placement at either the front or back of the zoo had no moderating impact on the outcome.

However, an effect was identified for the combination of *Tastimal* animal and snack: overall the selection of snacks paired with the iguana was significantly lower than that paired with the tamarin (199 vs. 272, odds ratio = 1.37, $p < .001$), the Cramer's V was .19, which represented a small-to-medium effect size (Rea & Parker, 1992). The odds of choosing a snack paired with the tamarin was 37% higher than if paired with the iguana. A post hoc analysis of the combinations of *Tastimal* animal pairing and fruit preference revealed that children were most likely to select the banana paired with the tamarin, and least likely to select the carrots when paired with tamarin (see Table 2).

Analysis of snack selection preferences independent of a *Tastimal* pairing demonstrated that the order of children's snack preferences was apples (36%), bananas (34%), oranges (19%), and carrots (11%).

Findings from the survey, which was conducted in the second round of the test, found that children were receptive to the *Tastimal* animals and to animals in general (Table 1). The average age of respondents was 8½ years and a total of 69 surveys (39%) were collected of a likely possible 175, the maximum number of individuals visiting any one table as evidenced by the tickets collected during each test. Across all of the survey questions, nearly all responses were in the "happy face" response category, with no responses approaching a negative or even indifferent average score.

Discussion

This study found that children were 66% more likely to select a produce item when it was paired with an animal character. The pairing of certain animals with certain snacks in this study showed some differences in their likelihood of selection, and suggests that certain animal-produce pairs have a differential impact on children's produce selection. For example, the pairing of a banana with the tamarin, a primate, resulted in significantly higher selection than other combinations including the banana alone. While results are limited to the selections tested, study results raise curiosity about the potential effect of the pairing of cartoon animals with an expanded selection of healthier foods, additional vegetables, and the potential for their use in other retail settings beyond the zoo.

Underlying Mechanisms

Future research is needed to understand more about the underlying mechanisms that make the animal-food pairings effective. However, several key elements from the marketing literature help explain the products appeal. First, there is good evidence that children are strongly attracted emotionally toward animals and provide them with greater attention than

toward other types of stimuli (LoBue, Megan Bloom, Sherman, Axford, & DeLoache, 2013). Once the animal has attracted the child's attention, the associated food pairing appears in the same frame, and is more likely to be noticed and considered.

At the same time, affect transfer, that is, transferring the positive feelings associated with the *Tastimal* to the snack, could also be at play. An affect transfer argument is based on classical conditioning and has been demonstrated in an advertising context (Allen & Madden, 1985; Gresham & Shimp, 1985; J. Kim, Jeon-Su, & Bhargava, 1998). In our case, the unconditioned stimulus (*Tastimal*) arouses a positive affective response due to a child's affinity for animals or the look and feel of the character. Then, when the *Tastimal* is paired with healthy food (conditioned stimulus), the child's feelings for the animal are transferred to the food, thereby increasing its appeal. In other words, children would find the snack more appealing when associated with an animal character. It is unclear, however, if the affect transfer would sustain beyond the timeframe of the intervention and if it would remain once the stimulus was removed.

The cause may also be behavioral: being involved in a fun, interactive process of choosing a produce item could maintain the children's interest for longer and at deeper levels. Baranowski et al. (2000), for example, have found that fun strategies to enhance healthy eating can be effective for younger children. While this theory is plausible and possibly part of the appeal, the strictly behavioral explanation would not fully describe why the carrots paired with the iguana were not as popular as the tamarin with the bananas. A combination of these underlying mechanisms appears the most likely explanation of findings.

Retail Environment Marketing Strategies

Public health approaches to marketing healthier foods in the food retail environment are understudied and relatively uncommon. However, in-store food marketing driven by manufacturers is very common. Proctor and Gamble, for example, has used the term "first moment of truth" to describe the 3 to 7 seconds when the consumer first views a product in the store (Stilley, Inman, & Wakefield, 2010). The consumer plans only about 30% of purchases down to the specific brand of the product, while about 10% of purchases are planned without a specific brand of product in mind (Stilley et al., 2010). The vast majority (59%) of purchases are entirely unplanned and made in the store.

Although adults, not children, typically purchase food in supermarkets, children often play an influential role in the foods selected for purchase. Prior research demonstrates that girls typically have more of an influence than boys, and that older children request items less frequently but that their requests are more likely granted (Haselhoff, Faupel, & Holzmüller, 2014). When children shop with their parents an in-store dynamic is often at play where the children directly and indirectly influence purchasing as they aim to fulfill spontaneous desires while parents seek to restrain their children's influence (Haselhoff et al., 2014). Children have most influence over lower cost purchases and those that are most relevant to them including cereals, juices, snacks, school products, and similar items (Martensen & Gronholdt, 2008). Further research supports the notion that children are more likely to influence unplanned and unhealthy food purchases exacerbated by marketing environment

that may limit interaction with healthy food while attracting attention to less healthy selections (Wingert, Zachary, Fox, Gittelsohn, & Surkan, 2014).

In-store signage, optimal placement, and advanced technology mechanisms to attract and maintain the consumer gaze are strategies utilized by all major manufacturers and retailers (Glanz, Bader, & Iyer, 2012). However, application of these approaches to understand and maximize use of effective in-store strategies to promote public health now represents a promising way to improve dietary quality (Glanz et al., 2012). If roughly 59% of purchases are unplanned in retail settings, researchers can assume an equal, if not higher, amount of purchases are unplanned in a recreational setting like a zoo.

National efforts to influence the diets of children are well underway and have begun to expand beyond traditional nutrition education approaches into the context of policy, systems, and environmental changes (Foster et al., 2014; Harries et al., 2014; Robert Wood Johnson Foundation, 2013). Furthermore, the application of marketing approaches that serve to shift purchasing and selection toward healthier foods are now being widely implemented in schools. Efforts to shift purchases at concession stands and in supermarkets are also under study though a specific set of approaches for these venues have only begun to be studied.

Nationally, there exists a particular interest in developing approaches that could be effective in encouraging healthy food purchases for SNAP (Supplemental Nutrition Assistance Program) consumers. For example, a recent report by the USDA describes how innovative, evidence-based interventions targeted at promoting healthy behavior in food retail establishments could be undertaken (Gordon et al., 2014). Among the approaches featured include efforts to maximize the in-store display and visibility of healthy foods. Similarly, guidelines released by Healthy Eating Research emphasize in-store marketing strategies that promote health in small stores as a promising strategy to accelerate childhood obesity prevention efforts nationally (Laska & Pelletier, 2016). To date, several studies in the public health literature have examined the importance of price, product, promotion, and placement marketing in the store environment, though given the layers of marketing approaches in supermarkets it is often difficult to isolate the influence of a shelf tag from, say, price (Foster et al., 2014).

A relatively well-known and well-used strategy to increase the appeal of healthier foods for children is the Smarter School Lunchroom Movement. The approach was developed at the USDA funded Cornell Center for Behavioral Economics in Child Nutrition Programs (The BEN Center) and today serves as a model set of strategies to incentivizing healthy food sales in venues across the United States (Hanks, Just, Smith, & Wansink, 2012; Wansink & Devereaux, 2014). One of the pillars of the approach is to provide schools with low-cost/no-cost strategies that increase the appeal of healthier foods for children (Hanks et al., 2013). Schools are encouraged to review their own practices using the “Smarter Lunchrooms Self-Assessment Scorecard” that enumerates specific evidence-based strategies that can be implemented in the lunchroom and allows the school to evaluate the extent to which the strategies are currently being implemented. This tool has been used to assess more than 5,000 schools across the United States since its creation. A similar approach is now underway with regard to creating a supermarket scorecard (Hanks et al., 2012).

The findings of this study clearly align with the types of strategies that both the supermarket scorecard and lunch-room self-assessment tool articulate. Our data, which indicate that children were 66% more likely to select a snack when paired with an animal cartoon *Tastimal*, are consistent with the findings articulated by Wansink and colleagues for similar strategies. For example, moving and highlighting fruit in a cafeteria line can increase sales by up to 102% and naming vegetables and displaying the new names with the foods in a school cafeteria was shown to increase the selection of vegetables by 40% to 70% (Hanks et al., 2012; Wright, 2014). A very recent study of a branded vegetable character display in cafeterias resulted in a net 12% increase in salad bar vegetable selection, a 90.5% increase over baseline.

Study Limitations and Future Directions

The effect of the *Tastimal* animals is likely limited, though it is yet unknown where the boundaries of the effect lie. It is clear that children made choices influenced by the animal association; however, further research is needed to determine if the same children will be more likely to actually consume the snacks in future instances or if the child expects the paired item to taste better. These results are also limited to the produce options that were used. Researchers intentionally chose attractive, popular, and convenient fruits and vegetables. It remains to be determined how much of an effect *Tastimals* would have on other produce items, including those less convenient and less popular. Additionally, children were only given healthy options to choose from. It is likely that more interventions must be made in order to entice children to still choose a healthy item versus a less healthy snack, like potato chips or candy. In addition, we focused on produce as an umbrella category, future research is need to see whether fruits, which children tend to prefer to vegetables, are more or less amenable to such an intervention. Similarly, the lack of pairing as the contrast condition leaves uncertainty for the effects other stimuli may have on the child's produce choices. Further research is needed to investigate the impact of the pairings on children of a wide range of demographics and psychographics while at the same time additional research should compare *Tastimals* as a strategy to other brand and marketing stimuli. Last, while we purposely sought to test the character pairings with a broad public audience during a high-traffic time, it is also true that the test setting, a zoo, is likely to attract children or parents with a greater than average affinity for animals, which may have affected results The *Tastimal* characters were illustrated in a way that may have suggested to some participants that the Iguana was more feminine (longer eyelashes) and the Tamarin was more masculine. However, perceptions of characters' gender were not evaluated and participant gender was not collected. Future studies should examine how gender might influence the effect of animal characters on children's fruit and vegetable choices.

Conclusion

In our study, children were more likely to choose a banana when paired with the tamarin, than carrots when paired with the same tamarin character, suggesting a unique appeal for product-animal combinations, which requires further study. Additional questions for further study include a closer examination of the impact of assigning a gender to the characters and expansion of the products tested beyond the produce items here. This study demonstrates children were 66% more likely to select a healthy snack when an animal cartoon called a

Tastimal was displayed in association with the produce item. Findings suggest that public health marketing efforts that seek to increase the appeal of fruits and vegetables to children should consider application of animal cartoons as part of their approach.

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References

- Allen CT, Madden TJ. A closer look at classical conditioning. *Journal of Consumer Research*. 1985; 12:301–315.
- Baranowski T, Davis M, Resnicow K, Baranowski J, Doyle C, Lin LS, ... Wang DT. Gimme 5 fruit, juice, and vegetables for fun and health: Outcome evaluation. *Health Education & Behavior*. 2000; 27:96–111. [PubMed: 10709795]
- Campbell-Arvai V, Arvai J, Kalof L. Motivating sustainable food choices: The role of nudges, value orientation, and information provision. *Environment and Behavior*. 2014; 46:453–475.
- Foster GD, Karpyn A, Wojtanowski AC, Davis E, Weiss S, Brensinger C, ... Glanz K. Placement and promotion strategies to increase sales of healthier products in supermarkets in low-income, ethnically diverse neighborhoods: A randomized controlled trial. *American Journal of Clinical Nutrition*. 2014; 99:1359–1368. [PubMed: 24695894]
- Frazier, M. Should the polar bear still sell Coca-Cola?. *The New Yorker*. 2014 Nov 6. Retrieved from <http://www.newyorker.com/business/currency/polar-bear-still-sell-coca-cola>
- Glanz K, Bader MD, Iyer S. Retail grocery store marketing strategies and obesity: An integrative review. *American Journal of Preventive Medicine*. 2012; 42:503–512. [PubMed: 22516491]
- Gordon, E., Dawkins-Lyn, N., Hogan-Yarbro, R., Karpyn, A., Shore, K., Weiss, S., Cash, S. Approaches for promoting healthy food purchases by SNAP participants. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service; 2014.
- Gresham LG, Shimp TA. Attitude toward the advertisement and brand attitudes: A classical conditioning perspective. *Journal of Advertising*. 1985; 14(1):10–49.
- Guthrie JF, Mancino L, Wansink B, Just DR. Applying behavioral economics research to improving children's food choices at school. *FASEB Journal*. 2011; 25:30.7. (Meeting Abstract).
- Hanks AS, Just DR, Brumberg A. Marketing vegetables in elementary school cafeterias to increase uptake. *Pediatrics*. 2016 Jul.138(2)doi: 10.1542/peds.2015-1720
- Hanks AS, Just DR, Smith LE, Wansink B. Healthy convenience: Nudging students toward healthier choices in the lunchroom. *Journal of Public Health*. 2012; 34:370–376. [PubMed: 22294661]
- Hanks AS, Just DR, Wansink B. Smarter lunch-rooms can address new school lunchroom guidelines and childhood obesity. *Journal of Pediatrics*. 2013; 162:867–869. [PubMed: 23434267]
- Harries C, Koprak J, Young C, Weiss S, Parker KM, Karpyn A. Moving from policy to implementation: A methodology and lessons learned to determine eligibility for healthy food financing projects. *Journal of Public Health Management and Practice*. 2014; 20:498–505. [PubMed: 24594793]
- Harris JL, Brownell KD, Bargh JA. The food marketing defense model: Integrating psychological research to protect youth and inform public policy. *Social Issues Policy Review*. 2009; 3:211–271. [PubMed: 20182647]
- Harris JL, Graff SK. Protecting children from harmful food marketing: Options for local government to make a difference. *Preventing Chronic Disease*. 2011; 8(5):A92. [PubMed: 21843422]
- Haselhoff V, Faupel U, Holzmüller HH. Strategies of children and parents during shopping for groceries. *Young Consumers*. 2014; 15(1):17–36.

- Hatt, EL. PHA launches FNV fruit and vegetable brand. 2015. <http://www.groceryheadquarters.com/March-2015/PHA-Launches-FNV-Fruit-and-Vegetable-Brand/>
- Kim J, Jeon-Su L, Bhargava M. The role of affect in attitude formation: A classical conditioning approach. *Journal of the Academy of Marketing Science*. 1998; 26:143–152.
- Kim SA, Moore LV, Galuska D, Wright AP, Harris D, Grummer-Strawn LM, ... Rhodes DG. Vital signs: Fruit and vegetable intake among children: United States, 2003–2010. *Morbidity and Mortality Weekly Report*. 2014; 63:671–676. [PubMed: 25102415]
- Kotler JA, Schiffman JM, Hanson KG. The influence of media characters on children's food choices. *Journal of Health Communication*. 2012; 17:886–898. [PubMed: 22475307]
- Kraak VI, Story M. A public health perspective on healthy lifestyles and public-private partnerships for global childhood obesity prevention. *Journal of the American Dietetic Association*. 2010; 110:192–200. [PubMed: 20102845]
- 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*. 2015; 16:107–126. [PubMed: 25516352]
- Laska, M., Pelletier, JE. Minimum stocking levels and marketing strategies of healthful foods for small retail food stores. Durham, NC: Healthy Eating Research; 2016.
- Liu PJ, Wisdom J, Roberto CA, Liu LJ, Ubel PA. Using behavioral economics to design more effective food policies to address obesity. *Applied Economic Perspectives and Policy*. 2014; 36(1):6–24.
- LoBue V, Megan Bloom P, Sherman K, Axford C, DeLoache JS. Young children's interest in live animals. *British Journal of Developmental Psychology*. 2013; 31:57–69. [PubMed: 23331106]
- Martensen A, Gronholdt L. Children's influence on family decision making. *Innovative Marketing*. 2008; 4(4):55–60.
- Melson, LG. Why the wild things are: Animals in the lives of children. Cambridge, MA: Harvard University Press; 2001.
- Miterko, K. A must see: The First Lady, Big Bird, and Billy Eichner team up for eat brighter! [Web log post]. 2015 Feb 17. Retrieved from <http://www.letsmove.gov/blog/2015/02/17/must-see-first-lady-big-bird-and-billy-eichner-team-eat-brighter>
- Newman, AA. The New York Times. 2012 Jul 6. Making children hanker to eat broccoli and carrots; p. B3
- Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the united states, 2011–2012. *JAMA*. 2014; 311(8):806–814. [PubMed: 24570244]
- Pivonka E, Seymour J, McKenna J, Baxter SD, Williams S. Development of the behaviorally focused fruits & Veggies: More matters public health initiative. *Journal of the American Diabetic Association*. 2011; 111:1570–1577.
- Rea, L., Parker, R. Designing and conducting survey research. San Francisco, CA: Jossey-Bass; 1992.
- Robert Wood Johnson Foundation. Creating a healthy concession stand. Princeton, NJ: Author; 2013.
- Sigman-Grant M, Byington TA, Lindsay AR, Lu M, Mobley AR, Fitzgerald N, Hildebrand D. Preschoolers can distinguish between healthy and unhealthy foods: The all 4 kids study. *Journal of Nutrition Education and Behavior*. 2014; 46:121–127. DOI: 10.1016/j.jneb.2013.09.012 [PubMed: 24246710]
- Sobal J, Wansink B. Kitchenscapes, tablescares, plates-capes, and foodscapes: Influences of microscale built environments on food intake. *Environment and Behavior*. 2007; 39:124–142.
- Stilley KM, Inman JJ, Wakefield KL. Spending on the fly: Mental budgets, promotions, and spending behavior. *Journal of Marketing*. 2010; 74(3):34–47.
- Stitt C, Kunkel D. Food advertising during children's television programming on broadcast and cable channels. *Health Communication*. 2008; 23:573–584. [PubMed: 19089704]
- Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: policy and environmental approaches. *Annual Review of Public Health*. 2008; 29:253–272.
- Tal A, Wansink B. An apple a day brings more apples your way: Healthy samples prime healthier choices. *Psychology & Marketing*. 2015; 32:575–584. DOI: 10.1002/mar.20801
- U.S. Census Bureau. QuickFacts: Wilmington City, Delaware. Washington, DC: Author; 2015.

- Wansink B, Devereaux J. Slim by design for schools. *Child Obesity*. 2014; 10:445–447.
- Wingert K, Zachary DA, Fox M, Gittelsohn J, Surkan PJ. Child as change agent. The potential of children to increase healthy food purchasing. *Appetite*. 2014; 81:330–336. DOI: 10.1016/j.appet.2014.06.104 [PubMed: 24996593]
- Wright, M. Smarter lunchroom movement fights childhood obesity. *Cornell Chronicle*. 2014 Mar 28. Retrieved from <http://www.news.cornell.edu/stories/2014/03/smarter-lunchroom-movement-fights-childhood-obesity>

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Figure 1.
Tastimal character images.

Figure 2.
Example table layout.

Table 1

Youth Survey Findings.

Variable name	<i>M (SD), N = 69</i>
Age (years)	8.55 (2.24)
I like the <i>Tastimals</i>	2.81 (0.43)
I think the <i>Tastimals</i> animals are fun	2.88 (0.37)
I like how the <i>Tastimals</i> animals look	2.93 (0.26)
I love animals	2.97 (0.17)

Note. ☹ = 1; 😐 = 2; ☺ = 3.

Table 2

Selection Frequency for Combinations of Snacks and Animals.

Snack	Animal	Table	Number of children selecting
Carrot	Iguana	Green	34
	Tamarin	Red	16
	None	Green	16
	None	Red	20
Orange	Iguana	Green	32
	Tamarin	Red	67
	None	Green	29
	None	Red	15
Apple	Iguana	Red	99
	Tamarin	Green	73
	None	Green	63
	None	Red	36
Banana	Iguana	Red	34
	Tamarin	Green	116
	None	Green	54
	None	Red	51

Table 3Log-Linear Models of Interaction Effects ($N = 755$).

Model	Estimates	df	χ^2	p value
Model 1: Interaction between <i>Tastimal</i> and table location				
<i>Tastimal</i>	0.256	1	45.83	<.001
Table	0.112	1	8.82	.003
<i>Tastimal</i> * Table	-0.029	1	0.60	.437
Model 2: Interaction between <i>Tastimal</i> and snack				
<i>Tastimal</i>	0.256	1	37.23	<.001
Snack (bananas as reference)	—	3	113.13	<.001
Carrot	-0.663	—	56.76	<.001
Orange	-0.221	—	8.30	.004
Apple	0.461	—	56.68	<.001
<i>Tastimals</i> * Snack (bananas as reference)	—	3	5.00	.172
<i>Tastimal</i> * Carrot	-0.092	—	1.09	.297
<i>Tastimal</i> * Orange	0.149	—	3.81	.051
<i>Tastimal</i> * Apple	0.020	—	0.11	.742
Model 3: Interaction between animals and snacks				
Animal	—	2	13.27	.001
Iguana	-0.201	—	10.19	.001
None	0.175	—	9.17	.003
Snack (bananas as reference)	—	3	105.42	<.001
Carrot	-0.685	—	55.07	<.001
Orange	-0.161	—	4.55	.033
Apple	0.514	—	70.36	<.001
Animal * Snack (bananas as reference)	—	6	57.51	<.001
Iguana * Carrot	0.433	—	12.09	.001
Iguana * Orange	-0.152	—	1.77	.184
Iguana * Apple	0.303	—	12.15	.001
None * Carrot	0.115	—	0.90	.344
None * Orange	-0.209	—	3.98	.046
None * Apple	-0.073	—	0.78	.377