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THE INFLUENCE OF NOVEL FOOD BRAND PACKAGING AND CHILD  
IMPULSIVITY ON AD LIBITUM MEAL INTAKE IN 7-9 YEAR-OLDS

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## ABSTRACT

The purpose of these studies was to determine the impact of food branding on children's intake at laboratory test-meals. We tested children's intake at three test-meal conditions, plain packaging, familiar packaging (e.g. Kraft), and a novel brand created for this study called Kaiyo. We hypothesized that 1) child familiarity with Kaiyo will be low, but perceived liking will be high, 2) children will consume more energy from foods with familiar packaging than from novel Kaiyo packaging, and 3) children with higher impulsivity will have higher intake of foods from the novel brand compared to the familiar brand and plain packaging. Study 1 reports on the creation of the Kaiyo brand. Study 2 reports on 7-9 year-old (n=20) children's pilot testing of the familiarity, emotional response, and excitement rating of the 160 food brands and non-food brands used in Study 3. Results showed 0% familiarity, neutral happiness rating ( $3.0 \pm 1.1$ ), and slightly low excitement rating ( $2.3 \pm 1.1$ ) for Kaiyo. In Study 3, 7-9 year-old (n=7) children participated in 3 meal sessions, each featuring the same common food items either in plain, branded, or Kaiyo packaging. Liking and preference tests were administered before each meal featuring the packaging that would be seen in the meal. Children's impulsivity was assessed using a validated questionnaire administered using Qualtrics. Anthropometric and demographic data were gathered and recorded. No significant correlations were found in energy intake or liking and preference among meal conditions. Children with higher impulsivity had higher BMI z-scores (Spearman's  $\rho = -0.76$ ;  $p = 0.05$ ) and rated chips higher during the Kaiyo condition (Spearman's  $\rho = -0.81$ ;  $p = 0.03$ ). Correlation to chips could demonstrate a link between impulsivity and acceptance of novel brands. A major limitation to drawing firm conclusions at this point was the small sample size. As more participants are added, data should again be tested for significant differences in intake and liking between meal conditions.

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## **Introduction**

### ***Childhood obesity***

Childhood obesity is a growing concern in the United States and can be seen in children as young as two years of age<sup>1-4</sup>. Statistics from 2004 show that 17.1% of US children and adolescents were overweight, were 32.2% are obese<sup>1,4</sup>. These statistics show an increase of 2% in boys and 4% in girls from the previous four years, demonstrating the increasing prevalence of this disease<sup>4</sup>. Increase in percent of children being overweight or obese in the United States had been rising significantly from 1988 to 2004, especially in adolescents of Mexican-American and non-Hispanic black races<sup>5</sup>. Most recent data from 2011-2012 showed no significant variation from 2004, with 16.9% of 2-19 year-olds and 34.9% of adults over 20 years old being obese. These statistics reveal that obesity prevalence remains high in the United States today<sup>6</sup>.

This is cause for concern since obesity has been linked to many serious health risks, including hypertension, metabolic syndrome, dyslipidemia, cancer, arthritis, respiratory problems, psychosocial problems, decreased physical activity, hypercholesterolemia, Type 2 diabetes, and all cause mortality<sup>2,3,7</sup>. High blood pressure, hardening arteries, type 2 diabetes, nonalcoholic fatty liver disease, polycystic ovary disorder, and disordered breathing during sleep are symptoms that once only appeared in adults, but are now seen in youth. These problems are all associated with carrying excess body fat, and can be related back to the increase in childhood obesity. Childhood obesity puts youth at risk for many more metabolic, digestive, respiratory, skeletal, and psychosocial disorders. Medical costs are reflective of the diseases associated with obese individuals. Obesity annually raises the cost of health care by \$2,741<sup>7</sup>. Based on these data, it is not surprising that for the first time, trends indicate that children may begin having lower life expectancies than their parents<sup>8</sup>.

### ***Intake patterns are linked to obesity***

Childhood obesity is linked to food intake patterns, making research into the factors that influence child food choice crucial in changing obesity trends. Food intake in children is dependent on both environmental and genetic factors. In the United States, children are surrounded by energy dense foods that are high in sugar, salt, and fat. This exposure pushes Americans towards foods that are highly palatable and energy-dense, and when overeaten, can contribute to the development of obesity. Children tend to eat what they like, and taste is the most important determinant of children's food choice <sup>9</sup>. Further research into factors that influence child liking can provide clues on methods to alter intake and therefore shift childhood obesity trends <sup>10</sup>.

### ***Food preference development***

Genetic factors act in conjunction with the external environment to impact the development of food preferences in children. A genetic predisposition to prefer sweet and salty and reject sour and bitter is in place as preexisting, or unlearned, preferences <sup>10</sup>. Trends demonstrate that people chose food more based on taste than health, which is why children are initially drawn to sweet and salty items <sup>9</sup>. Additionally, the past three decades have been marked by a shift in our environment to obesity-promoting, or obesogenic. This is seen through changes in advertising, portion sizes, and social influences <sup>11</sup>. Neophobia also plays a key role, causing children to eat what is familiar and back away from what is not <sup>10</sup>. Child food neophobia can be hereditary, and there is a strong correlation between BMI and maternal BMI in children who are highly neophobic <sup>12</sup>.

In addition to genetic factors, learned behavior plays a role in food preference based on the post-ingestive consequences of consuming specific foods. However, because foods that are initially preferred often bring pleasurable consequences, it can be difficult to alter diet away from those items, even when positive consequences are seen with consumption of new foods <sup>10</sup>. To



increase the likelihood of change in preference based upon new experiences, two techniques can be used. First, repeated tasting of a disliked food can create liking through learned behavior. Since choice is based upon perceived utility or previously experienced utility, repetition can not only alter preference, but also alter choice <sup>13,14</sup>. Secondly, the way that choices are presented can alter preference in a technique known as the “framing effect” <sup>15</sup>. By taking advantage of the “framing effect”, parents, food companies, and researchers can draw an audience in to the preference they want the audience to choose, making it appear more desirable.

Keeping genetic and environmental factors in mind, it is important to understand the psychology behind food choice. People can have implicit and explicit feelings for a food item at the same time. Implicit feelings are unconscious, spontaneous feelings for a product. These feelings overpower explicit feelings when a time restraint is in place. Explicit feelings are conscious, deliberate feelings and are most prevalent when there is no time constraint. The main difference between the two is that implicit results in an unconscious attitude or choice, while explicit results in a conscious attitude or choice. This suggests that children will choose a food item on impulse with a time constraint, but will consider their food choice and choose deliberately if given ample time <sup>16</sup>. This difference may be of importance when examining impulsivity of children. Those that have a more impulsive nature may base choice more heavily on implicit feelings, while those that have a less impulsive nature may base choice more on explicit, thought-out feelings.

Preferences are linked to food choice and eating behavior in children. These preferences stem from genetic factors, external environment, pleasurable taste, learned behavior, time-frame, and impulsivity, among many additional factors <sup>9,10,13–17</sup>. In order to fully understand choice, preference based on these multiple components must be considered. Since choice plays a key role in energy and nutrient consumption, these factors may contribute to childhood obesity.

### ***Food marketing and obesity***

Research shows that food marketing is one factor that can impact food choice, and, at times, can overpower taste preferences. While some preferences are internal and cannot be easily altered, marketing is one method that can be manipulated to change food preference, choice, and intake, as seen in Tom Robinson's study, "Effects of Fast Food Branding on Young Children's Taste Preferences"<sup>18</sup>. In this study, placing a McDonald's ® logo on food products increased children's liking for these products, even when the foods were healthier options like apples.

Food marketing exposure is positively linked to childhood obesity<sup>19-23</sup>. Since brand attachment can psychologically develop in individuals as young as toddler age, food companies develop marketing materials to target children through television advertising, in-school marketing, product placement, kids clubs, the internet, toys, and youth promotions<sup>19</sup>. Television is one of the first forms of marketing people are exposed to, making it a primary route for child marketing<sup>20</sup>. Foods that are generally marketed specifically to children are high in sugar and fat to reflect their genetic preferences<sup>19,20</sup>.

Children in this country are exposed to higher amounts of obesogenic television food advertisements than children in other parts of the world. This was discovered using a study across the United States, Australia, and eight European countries. Not only did the United States have the highest proportion of overweight children, but also had the highest advertisements per hour in the categories of sweet/ fatty foods and obesogenic advertisements. This correlation was especially strong in regards to advertisements that featured energy dense, low micronutrient containing foods. There was also a slight, less significant negative correlation between proportion of overweight children in a country and number of healthy food advertisements per hour shown in that country. Currently, the United States has so few healthy food commercials that the breakdown put them at zero advertisements per 20 hours on children's television. The

combination of many television advertisements for sweet/fatty foods and too few healthy food advertisements is hypothesized to contribute to child overweight in the United States <sup>24</sup>.

Exposure to food advertisements is associated with increased energy intake, especially in overweight and obese children <sup>22,23,25</sup>. Not only do studies suggest that obese children are more responsive to marketing techniques, but they additionally suggest that obese children recognize significantly more brands than healthy weight children and that recognition rate is correlated to amount consumed post exposure <sup>25</sup>. In preschool children, there is also an association between fast food consumption and hours spent in front of the television. A study done by Taveras et al. found that 22% of children ate fast food at least once a week and that these children were watching more television than those children with lower fast food intake <sup>26</sup>.

Therefore, the sedentary behavior related to watching high amounts of television is not the only reason that those who watch more television tend to have higher BMIs. These children are hit twice: once by lack of physical activity while watching television and secondly by an increased intake of foods high in fat and sugar because of direct exposure to the food advertisements <sup>25</sup>. The time children spent watching television is additionally correlated to number of requests they make for advertised foods and drinks. Their request for purchase of these food items is where television exposure and weight status intersect. Viewing television exposes children to energy dense food advertisements, which increases their desire for consumption of those food items. This leads to a request to purchase which ultimately leads to consumption of high energy dense foods, increasing risk for obesity <sup>27</sup>.

Children who view more food commercials on television show higher preferences for high carbohydrate and high fat foods that are both branded and non-branded. This demonstrates a relationship to food type preference, not solely brand preference <sup>20,21</sup>. It is harder to influence a child with marketing healthy options than it is to influence them with energy dense options, especially if the child is highly neophobic. This is likely due to their genetic taste predisposition

to prefer sweet and salty <sup>28</sup>. Integrating the reinforcing effects of food advertising and marketing with the already palatable cocktail of sugar, fat, and salt creates an almost irresistible food product. This may be why the percentage of energy dense food advertisements increases during prime television viewing hours for children <sup>29</sup>. Children likely will be more susceptible to marketing campaigns that surround foods they already have taste preferences for. A study by Kelly et al. found that 11-29% of television commercials were food ads, with over half of these focusing on energy dense items during all hours of the day <sup>29</sup>. Another study by Powell et al. found that 36.4% of commercials seen by children were for food products, demonstrating an even larger prevalence than what was found by Kelly et al. Powell et al. also found that 97.8% of food advertisements seen by children ages 2 to 11 years old were high in sugar, fat, or sodium <sup>30</sup>. Both studies suggest that children who watch television are exposed to many advertisements for energy dense food items.

### ***Food branding and obesity***

While food marketing is the process of convincing consumers to buy a product, branding is the creation of the personality, mission, and identity of a product. Branding creates an identity that relates to the ideal consumer through design, characters, color, font, etc. Mark McCulloch of Spectacular Marketing explains the difference as, “Marketing is what you do to get your message or promise to customers, while your brand is how you keep the promise made through delivery to the customers and colleagues” <sup>31</sup>.

Food branding impacts food choice and amount of food consumed by children. The degree to which children are responsive to food branding varies. Keller et al. looked at 4-6 year-old intake in a branded, plain, or novel packaged meal <sup>32,33</sup>. Results showed that overweight children consumed more energy from meals when food brands were visible on the packages, while non-overweight children showed the opposite response <sup>33</sup>. Additionally, she examined changes in intake among 7-9 year-olds when a meal was packaged with or without a logo from a

popular fast food restaurant. She then did a pilot intervention to view how spokes characters could act to increase child intake of fruits and vegetables. These studies found that some children were more susceptible to branding than others and that more research is needed in this area <sup>32</sup>. Brand loyalty and brand personality are influenced by a combination of factors <sup>34</sup>. Exposure to a brand by a consumer on multiple occasions can encourage the consumer to favor that brand, as expressed by Janiszewski in her study with graduate students <sup>35</sup>. Branding techniques such as celebrity endorsers and fun food names, as well as package design paralleled to brand theme have been shown to increase consumption of food items in children ranging from 3-11 years-old <sup>36-38</sup>. Boyland et al. found that 8-11 year-olds ate more of a branded food item after viewing a television advertisement for that branded item, while not decreasing their intake of a generic branded food item. The combination of these two factors led to overconsumption <sup>36</sup>. Additionally, Musher-Eizenman et al. found that toddlers ate more of a healthy food item when it was labeled with a fun name, rather than a healthy name, and that a greater percentage of children were willing to try the food when it featured the fun name <sup>37</sup>. These studies collectively suggest that food branding and marketing can influence children's intake of both healthy and unhealthy foods, however, additional research is needed to understand why some children may be more susceptible than others.

A study done by Orth and Malkewitz explored the idea of paralleling packaging to the food item. This idea is a concept of tying the ideal consumer for a specific food item to a theme they will relate to and creating an appearance that speaks to that theme. This study concluded that exciting brands, the type of brand that children will be most drawn to, should have contrasting designs, while a sophisticated brand that their parents may prefer should have a more natural or delicate design <sup>38</sup>. Based on this, if a company hoped to create a food item for children, it would be best to give that food an exciting theme. To get the feeling of excitement to the consumer upon viewing, contrasting packaging design, or branding, would be the best choice.

These brand personalities of exciting and sophisticated were drawn from five brand personality dimensions that were validated by Aaker. Aaker defined these dimensions through a study linking 37 brands to 114 personality traits <sup>39</sup>.

Children as young as three years old have high recognition rates of brand logos and they are able to connect them with the foods with which they are associated <sup>40</sup>. These food logos activate some brain regions known to be associated with motivation <sup>41</sup>. Brand name imprinting is a technique of exposure used to create attachment to a brand <sup>42</sup>. Not only do individuals form attachment, but they form relationships with brands in the same way that they form interpersonal relationships, as found by Aggarwal in his study working with undergraduate students <sup>43</sup>. Companies focus heavily on branding and forming lifelong bonds with the consumer from a young age, focusing on fun, happiness, excitement, and energy. They do so through child advertising. Companies that are most prevalent in child advertising are fast food chains and sugary cereals <sup>44</sup>.

McClure et al. found that taste preferences differ between branded and blind taste-tests in adult consumers <sup>45</sup>. Brands can increase preference for food items, regardless of the type of food, especially in children <sup>18</sup>. After television viewers are exposed to food commercials, they have a higher preference for branded foods and increased reported preference for all food items as compared to preferences of individuals who watch little television. A study by Boyland et al. found that 6-13 year-old children who had a history of television brand exposure were more heavily influenced by interaction with a television food ad than children who were new to the world of food advertising and had not seen many television ads in the past <sup>21</sup>. This point is further supported by the fact that brand awareness has been shown to be a positive correlate to calorie consumption of branded items in 4-6 year olds <sup>33</sup>.

As mentioned above, overweight children show a greater response to food branding, and within studies they tend to consume more calories of a branded condition than a plain condition. On the other hand, healthy weight children consume less from the branded than the plain <sup>33</sup>. These findings suggest differences in susceptibility to food brands that may be biologically based. A separate study using functional magnetic resonance imaging found that obese children aged 10-12 showed significantly less brain activation than the healthy weight children in regions associated with cognitive control when they were viewing food brands compared to when they were viewing control pictures <sup>46</sup>. This provides evidence that obese children may be more vulnerable to certain forms of food advertising <sup>47</sup>.

However, there are inconsistencies across studies in this area, therefore additional research is needed. A study by Elliott et al. explored intake when 3-5 year-old children were given the same meal in four different types of packaging: McDonalds, Starbucks, plain, or colorful unbranded. Each child was assigned one of three conditions at each tasting session: McDonald's with Starbucks, McDonald's with plain, or McDonald's with colorful packaging. Children were presented with both packaging designs together and could choose to eat as much or as little of food from the two conditions as they wished. Surprisingly, children based food preference more heavily on bright package design than brand familiarity. There was a higher percentage of children who chose the colorful packaging than the McDonald's packaging for all food items in the condition that compared these two packaging designs <sup>48</sup>.

### ***How branding can be used to market healthy options***

Understanding how marketing and branding influence child food choice can play an integral role in improving the diet of children. Since preferences begin to form at a very young age, it is important to teach healthy habits while people are still in childhood. Birch focuses on environmental learning that can influence child eating patterns. Her extensive research has shown that familiarization and associative conditioning can both impact children's food

preferences. Children should be presented with healthy food options on multiple occasions to increase their familiarity. They should be given positive correlates to eating healthy foods to promote positive feelings for those food items <sup>10,11</sup>.

Additionally, parents and other people in children's social environments should make healthy choices to serve as an example in observation for the children <sup>11</sup>. Parents should also consider turning off the television during meal times. A continuous stimulus, such as the television, has been shown to disrupt eating cues and can lead to both increased eating time and increased calorie consumption <sup>46</sup>. With these three learning structures, children can be brought up in a household environment favoring healthy choices. This can help to counteract the obesogenic environment they will find outside their home <sup>11</sup>.

When looking to create a large scale marketing campaign to educate children on nutrition and influence food choice, the best place to start is researching best practices followed by food companies. Numerous studies have provided evidence that their techniques have been successful in creating brand loyalty and increasing food consumption in children, therefore these techniques should be considered in marketing healthy options. Child focus groups are used by these companies to understand the needs and desires of their target age range. Companies also avoid clumping all children into one audience category, but rather study their differences based on age, gender, socioeconomic status, etc. and make changes to their marketing techniques based on those breakdowns. These companies also understand that the strongest link to advertising to children is through television, with the average child aged 2 to 11 watching 26 hours of television a week.

For television, they have had the most success with attractive images, familiar songs, and catchy jingles because all three are easy for children to remember and match to a product. Sales promotions in areas where children or their parents often shop have also been successful, especially when packaging promotes prizes or premiums. McDonald's has become known as



“the children’s marketer” because they take advantage of all these techniques, and specify advertisements for children, parents, and different demographics of both, especially in regards to ethnicity. Additional marketing techniques focus on other forms of multimedia exposure, celebrity endorsement, kid’s clubs, and product placement in movies, comic strips, video games, etc. With McDonald’s as proof of the success these techniques bring, healthy marketing campaigns should take advantage of this research in promoting their products <sup>49</sup>.

Choices can be largely influenced by the way in which options are presented to children <sup>15</sup>. We know that techniques large companies use to frame their high energy density food items has been successful, therefore by using similar techniques, it might be possible for health professionals and parents to promote healthier food options. Smits and Vandebosch found that child consumption of both unhealthy and healthy foods can be increased by use of a spokes character. An unfamiliar character increased appetite, frequency of wished for consumption, and anticipated buying preference in children 6-7 years-old. Additionally, when the character was a known celebrity, these values were even stronger <sup>50</sup>. Another study by Kotler revealed similar results, with both liking and food choice higher in 2-6 year-olds for food items that featured a known and liked character. Correlates were not as strong with a character that children were not familiar with. This correlate was not only seen in the high energy density food items, but also with vegetables, fruits, and grains. This suggests that branding with a known character is a successful way of increasing healthy food consumption in children <sup>51</sup>.

De Droog et al. found that these results could be slightly altered with adding in a factor of congruence. For his study, congruence referred to pairing a food item with an animal that is normally seen consuming that item or pairing a food item with an object of the same color as the food. Both pairings are obvious associations to most people and cause mental congruence, or grouping. This study found that when presenting children with carrots, two package designs proved most effective for consumption. Packaging with a familiar character as well as packaging

with a conceptually and perceptually congruent character showed an equal automatic affective response even though the familiar character remained in the lead for elaborate affective response. This research suggests that an orange rabbit could sell a carrot much more successfully than a gray rhino could <sup>52</sup>. A study by Forwood et al. suggested that healthy options have a higher consumption rate when taste descriptor words are used, rather than health related descriptor words. Because humans rely on taste more than health in food choice, taste benefits should be emphasized when promoting a healthy food alternative, such as an apple for a dessert over a chocolate bar <sup>9</sup>.

### ***Purpose***

The studies conducted for this thesis sought to determine if there are differences in children's laboratory intake of test-meals packaged in plain packaging, familiar brand packaging, and an unfamiliar, but colorful, child-targeted character based packaging. They act to further explore the effects previously seen: overweight children consuming more from foods when branded vs. plain. In addition, these studies aim to provide more information regarding whether this trend is due to the branded packages being colorful and more appealing, or if this trend is due to familiarity with the food brand. There is currently inconclusive data on how branding works in children. This study will be instrumental in determining whether brand familiarity or colorful characters and packaging are the primary determinants of children's responses.

### ***Objectives***

This research has three key objectives. 1) The first is to develop a novel brand name, logo, and character to use as a novel brand in a test meal. This brand will be used to compare children's liking and intake of foods packaged in plain containers, familiar brand containers, or novel, unfamiliar character containers. This brand will be created with an exciting theme and congruent contrasting color scheme. It will be pilot tested for familiarity and liking. 2) Secondly, this research will test the impact of a novel food brand on food intake. 3) Lastly, this research

will test the association between child impulsivity and consumption of a novel brand over a familiar brand.

### ***Hypotheses***

1) I hypothesize that within the pilot study, child familiarity of the novel “Kaiyo” brand will be low, but child liking rating will be high due to the child-friendly design focused around a bright, fun character. If liking rating is low, this brand will be adjusted before the beginning of Study 3. 2) I further hypothesize that children will consume more energy from foods branded with familiar packaging than they will when foods are branded with plain or Kaiyo packaging. Despite branding techniques, I believe children will still maintain a higher energy intake from food brands they recognize due to the strong impact that familiarity has on children’s food preferences. 3) Lastly, I expect to see children with higher susceptibility to risk-taking/ higher impulsivity rating to have a higher energy intake of the novel brand.

### ***My Role in the Studies***

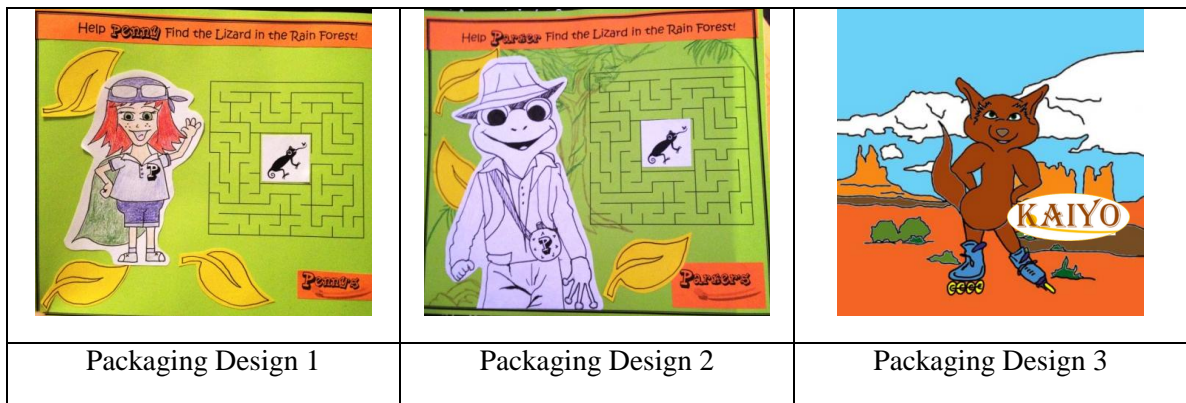
I started my work with these studies by conducting background research on childhood nutrition, neophobia, marketing, and functional magnetic resonance imaging. I then worked with Dr. Kathleen Keller to add the component of Kaiyo, a novel brand, to a study that she was developing with graduate student, Wendy Stein. I was responsible for the design of this character as well as the scientific hypotheses that went along with Kaiyo. I continued to be involved with the design of Studies 2 and 3 as they were being created, and posted fliers for participant recruitment. I ran studies with children, conducting all of the following methods. I then conducted data entry and data analysis to find significant results.

## Study 1 - Creation of “Kaiyo”

For this study, I created a novel brand to use in the follow-up test-meal sessions. Since this brand was designed for children, I used bright, exciting design techniques to develop a cartoon coyote named “Kaiyo”. Before finalizing the character, I conducted formative evaluation on two previous designs (see Packaging Design 1 and Packaging Design 2 in Figure 1 below), which were evaluated and critiqued by other researchers in the lab. Lab members were presented with each design as they were created, one at a time. They were asked to fill out a short questionnaire asking if they recognized the character from another source, if the character fit the age range we were targeting, and how likeable the character was. The first design (Packaging Design 1) was found to look too much like the popular children’s cartoon character, *Dora the Explorer*. To prevent results from reflecting this similarity and prevent participants from judging the brand based on pre-conceived ideas of *Dora the Explorer*, a second design was created. Packaging Design 2 also looked like a familiar cartoon character from children’s television and overall had a look that was suited for younger children than our audience.

To create a less elementary design, I researched children’s movies and television shows featuring cartoon characters. *Over the Hedge* became the inspiration for Packaging Design 3. These characters were designed to look like teenagers, with a spunky attitude reflected by their shape and movement. To reflect this in my design, I gave my coyote hips that lean to the side, put his hands on his hips, and put roller blades on his feet. Packaging Design 3 was received well by researchers in the lab and did not bring to mind any characters that children would be familiar with. Following the successful formative evaluation of this design, minor changes and updates were made using Adobe Photoshop to arrive at the Kaiyo logo used for Study 2 (Packaging Design 3).

**Figure 1. Packaging Designs**



## **Study 2 - Pilot Testing of Brands in Children**

### **2.1 - Purpose**

The purpose of this preliminary study was two-fold. First, this study was used to determine which food and non-food brands were familiar to children, so that researchers could apply this information to another portion of the study where fMRI was conducted, which will be reported in a separate paper. Researchers only wanted images of brands that were familiar to children to be used in this visit in order to gain accurate brain responses. Secondly, this study was performed to ensure that the food-brands, non-food brands, and novel brand Kaiyo rated similarly for emotional response and excitement. Researchers wanted familiarity to be low, meaning that the brand did not remind participants of any other preexisting brand, and wanted liking to be neutral so that excitement or happiness in response to the brand would not hinder results in Study 3.

## 2.2 - Methods

### *Participants*

Twenty children  $7.8 \pm 0.8$  years old participated in this study. Eleven of the participants were male, 9 were female. All children were Caucasian, with one participant being Hispanic Caucasian. Fifteen of the children were lean, while five were overweight. Children had an average BMI z-score of  $0.3 \pm 1.0$ , which corresponds to a BMI-for-age percentile of just over 50<sup>th</sup>%. These children were recruited from the community around The Pennsylvania State University, and participated in the study with a parent or legal guardian. Parents gave written informed consent for their child's participation and children gave verbal assent. The study was approved by the Institutional Review Board of The Pennsylvania State University.

**Table 1. Study 2 Demographics**

<b>Sex</b>	<b>% (n)</b>
% Male	55 (11)
% Female	45 (9)
<b>Ethnicity</b>	
% White	100 (20)
% Not-white	0 (0)
<b>Weight status</b>	
% Lean (BMI% = 0-85)	75 (15)
% Overweight (BMI % = 85-100)	25 (5)
	<b>Mean <math>\pm</math> SD</b>
<b>Age</b>	$7.8 \pm 0.8$
<b>BMI z-score</b>	$0.3 \pm 1.0$

### ***Screening***

Screening criteria required child participants to be reading at or above grade level without any learning disabilities or color-blindedness. Participants were also required to have English as their native language and be users of the television and internet. Additionally, limits were set on medical diagnoses and allergies to ensure that children were healthy, without major food allergies that would limit food exposures.

### ***Experimental Design***

Participants completed a 2 hour session to assess brand recognition and liking in the Metabolic Kitchen and Children's Eating Behavior Laboratory in 311 Chandlee Laboratory of The Pennsylvania State University. In addition, the following tests were performed.

### ***Questionnaires***

Parents were asked standard demographic questions and completed the Parent Brand Inventory Questionnaire. This was a checklist used to determine whether the 80 food and 80 nonfood brands used in this study were familiar to the children. Brand images were chosen based on results of internet searches for images and words that were recognizable and commonly associated with a particular product. These same 160 brands would appear later in the Brand Liking Test and can be seen in Table 2. The parent questionnaires took approximately thirty minutes to complete.

Children were asked to complete the Children's TV Survey, which took approximately fifteen minutes. This survey can be found in the Appendix and was used to gain information about child television watching habits in terms of amount of time spent watching television, where and when they were watching television, what shows they were watching, and if they watched commercials while watching television. They additionally were asked to tell researchers what they thought commercials were for. Researchers were interested in gaining this information



to see if responses correlated to brand familiarity and liking since previous studies have shown habitual television viewers to be more susceptible to branding techniques.

### ***Anthropometrics***

Child height and weight were measured and recorded. Children were weighed using an electronic scale, Tanita HD-351, in light clothing and stocking feet without a coat or jacket. Weight was recorded to the nearest 0.5 lb. Height was measured on a stadiometer to the nearest cm. Height and weight were used to calculate Body Mass Index (BMI) by converting height and weight to meters and kilograms and applying the equation  $BMI = kg/m^2$ . These measures were converted to BMI z-scores using the Center's for Disease Control and Prevention cut-offs.

### ***Child Brand Familiarity and Liking Test***

Children were shown 159 images of common food brand logos, such as Nesquick, McDonald's, and Barilla, as well as common non-food brand logos, such as Matchbox, Target, and Macy's. Kaiyo was integrated with these brands as a food brand logo to total 160 different brands. Eighty of these were non-food brands, and eighty of them were food brands. Images were shown one at a time using Microsoft PowerPoint with PowerPoint width set at approximately 5" and height varying. Images were shown in blocks of ten, alternating between food and non-food brand blocks. Images with similar pictures, colors, fonts, and sizes were separated throughout the slideshow. As needed, short breaks were taken between blocks to prevent child fatigue. After each image, children were asked if they recognized the brand. If they were familiar with the brand, they were asked to state the name of the product that the brand advertised for or "matched to". They then were asked to rate the image on how the image made them feel using two 5-point hedonic categorical scales. One scale ranged from sad (1) to happy (5), while the other ranged from bored (1) to excited (5), with the midpoint on both scales (3) serving as a neutral rating. These responses were recorded.

### *Variables of Interest*

In order to determine which food and non-food brands would be used in the primary study, brand familiarity across participants was analyzed. Any brands with low recognition rates would be replaced before the fMRI study. Additionally, happiness and excitement ratings for Kaiyo, the novel brand created for this study, were examined. Low scores for these two scales would implicate a need for change in design before the primary study.

### *Statistical Analysis*

Data from all twenty initial participants were used for the final analysis. Data were analyzed using SPSS for Windows, Version 20.0. Descriptive statistics were used to describe participants in terms of demographics. Participants were classified by BMI percentage as normal weight or overweight with percentage over 85 classifying as overweight and percentage under 85 classifying as normal weight. Recognition of brands was tested categorically, while liking was tested continuously. The percent of brands that could be recognized was calculated for the food brand and non-food brand categories separately. Percent of children who reported that they knew the brand was used for this analysis, regardless of if they were able to properly match the brand with its corresponding product or not. Mean scores for children's ratings of happiness and level of excitement associated with each brand picture were calculated. For the purpose of this analysis, 2.0-4.0 rating on this 5-point scale was considered neutral. Greater than 4.0 demonstrated ratings of child happiness or excitement, while less than 2.0 reflected child sadness or boredom. The data were visually examined to determine any food brands or non-food brands that had low or high scores for happiness and level of excitement. Percent of brands receiving a score greater than 4.0 for happiness or excitement was calculated separately for both food and nonfood brands. All tests were 2-tailed and p-values used to designate significance were  $p \leq 0.05$ . The main concern in all these tests was to evaluate Kaiyo in terms of child familiarity and liking.

Later studies will discuss the use of this analysis in the design of the fourth, fMRI visit for children who participated in Study 3.

## 2.3 - Results

### *Familiarity*

Average rating of child familiarity across all nonfood brands was 68.3%, while average rating of child familiarity across all food brands was 73.8%. Percentages of children familiar with each specific brand can be seen in Table 2. Zero percent of children reported Kaiyo as a familiar brand.

### *Children's Reported Emotional Response to the Brands*

On the 5-point emotional response/ sad-happy scale, children rated Kaiyo an average of  $3.0 \pm 1.1$ . Among other brands, both food and nonfood, no brands received ratings of child sadness ( $<2.0$ ). Children rated the Pampers brand the lowest ( $2.2 \pm 1.3$ ). Several other brands garnered ratings of child happiness ( $>0.4$ ), including: Nerf, Pepsi, Snickers, Doritos, Crayola, Domino's, Tostito's, Burger King, Reese's, Nintendo, Lay's, Poptarts, McDonald's, Subway, M&M, Lego, Pizza Hut, Twizzler, Oreo, Fruit Roll-Up, Walt Disney, Sour Patch, Hershey's, Gatorade, and XBOX. The highest average rating was for Hershey's at  $4.8 \pm 0.5$ .

Ten percent of nonfood brands received an average rating greater than 4.0, while thirty-three percent of food brands received a rating greater than 4.0. These details can be seen in Table 2.

### *Children's Reported Excitement in Response to the Brands*

On the 5-point bored to excited scale, children rated Kaiyo  $2.3 \pm 1.1$ . Of the other brands in the pilot study, only non-food brands garnered child bored ratings ( $<2.0$ ). These included Abercrombie & Fitch, Barbie, Pampers, Hanes, and Charmin, with Abercrombie & Fitch having the lowest rating of  $1.7 \pm 0.8$ . Brands that received ratings of child excitement ( $> 4.0$ ) were Nerf,

Pepsi, Snickers, Doritos, Crayola, Domino's, Reese's, Nintendo, Starbucks, McDonald's, Subway, M&M, Pizza Hut, Twizzler, Oreo, Walt Disney, Sour Patch, Hershey's, and XBOX. Of these, M&M and Hershey's had the highest ratings at  $4.7 \pm 0.07$  and  $4.7 \pm 0.8$ . Six percent of nonfood brands received an average rating greater than 4.0, while twenty percent of food brands received a rating greater than 4.0. These details can be seen in Table 2.

**Table 2. Brand Ratings on Familiarity, Emotional Response, and Excitement**

<b>Brand</b>	<b>% Familiar</b>	<b>Emotional Response</b>		<b>Excitement</b>	
		<b>Mean</b>	<b><math>\pm</math> SD</b>	<b>Mean</b>	<b><math>\pm</math> SD</b>
<i><b>Food Brands</b></i>					
Nabisco	30	3.2	1.3	2.4	1.2
Ragu	35	3.3	1.1	2.9	1.3
Pepsi	100	4.1	1.1	4.2	1.0
Campbell's	60	3.2	1.1	2.8	1.1
Tropicana	55	3.7	0.9	2.9	1.3
Snickers	100	4.6	0.7	4.5	0.9
JIF	100	3.6	1.1	3.3	1.2
Kool Aid	80	3.9	0.8	3.7	1.3
Doritos	100	4.4	1.0	4.2	1.1
Kraft	55	3.6	0.9	2.8	1.3
<b>Kaiyo</b>	<b>0</b>	<b>3.0</b>	<b>1.1</b>	<b>2.3</b>	<b>1.1</b>
Domino's	90	4.3	1.0	4.2	1.0
Betty Crocker	50	3.5	1.1	2.9	1.4
Tostitos	80	4.2	0.7	4.0	1.3
Burger King	95	4.1	0.9	3.9	1.1
Special K	70	3.2	1.2	2.6	1.5
Quaker	95	3.5	1.4	3.0	1.5
Mott's	85	3.6	0.8	3.3	1.2
Reese's	100	4.7	0.7	4.4	1.0
Nature Valley	55	3.2	0.7	2.5	1.2
Lay's	85	4.1	1.2	3.6	1.3
Ben & Jerry's	35	4.0	1.2	3.7	1.5
Sunny Delight	30	3.5	1.0	3.1	1.4
Kellogg's	75	3.5	0.8	3.5	1.1
Starbucks	90	3.1	1.2	2.3	1.3
Ritz	90	3.8	1.2	3.6	1.2

Poptarts	90	4.2	0.9	4.4	1.0
Capri Sun	75	3.7	1.0	3.0	1.3
Fritos	65	3.6	1.1	3.4	1.2
McDonald's	100	4.4	1.0	4.2	1.2
Eggo	60	3.6	1.1	3.3	1.3
Subway	95	4.5	0.7	4.3	1.0
Yoplait	95	3.5	1.2	2.9	1.4
Pepperidge Farm	50	3.1	1.0	2.9	1.3
Sunmaid raisins	85	3.6	0.8	3.2	1.5
Ocean Spray	60	3.4	0.9	3.0	1.3
Pillsbury	35	3.3	1.1	2.9	1.3
Cheerios	95	3.7	1.3	3.4	1.4
Powerade	45	3.6	1.1	3.0	1.4
M&M's	95	4.8	0.6	4.7	0.7
Taco Bell	95	3.7	1.1	3.3	1.5
Cheez-It	100	4.0	0.8	3.5	1.2
Cheetos	85	3.8	1.2	3.9	1.2
Progresso	45	3.2	1.0	2.6	1.4
Pizza Hut	100	4.3	0.9	4.5	0.9
Heinz	40	3.2	0.9	2.7	1.3
Keebler	95	4.0	0.9	3.7	1.3
Twizzler	95	4.3	0.9	4.3	1.0
Juicy Juice	80	3.7	0.9	3.3	1.3
Red Lobster	95	3.6	1.2	3.4	1.5
Oreo	100	4.2	1.0	4.3	0.9
Lunchables	95	3.7	1.0	3.6	1.4
Chili's	60	3.8	1.0	3.5	1.5
Birds Eye	20	3.3	1.1	2.7	1.4
Aunt Jemima	55	3.5	1.1	3.0	1.5
Planters	95	3.7	1.0	3.5	1.3
Chips Ahoy!	80	4.0	1.0	3.7	1.2
Snyder's	60	3.6	1.0	3.1	1.5
Fruit Roll-Ups	95	4.3	0.9	4.0	1.4
Smucker's	50	3.3	0.9	2.9	1.4
Sour Patch	95	4.1	1.0	4.1	1.1
Hershey's	100	4.8	0.5	4.7	0.8
Nesquick	65	3.8	0.9	3.2	1.5
Denny's	65	3.4	0.8	3.0	1.2
Mountain Dew	90	3.7	1.1	3.7	1.3
Spaghettios	50	3.5	1.1	3.0	1.3

General Mills	25	2.9	1.0	2.5	1.3
Gatorade	100	4.2	0.9	3.7	1.3
Dunkin Donuts	95	3.9	1.1	3.9	1.3
Coca-Cola	95	3.7	0.9	3.2	1.4
Orville Redenbacher's	50	3.6	1.0	3.3	1.4
Hidden Valley	55	3.4	1.0	2.6	1.4
Chef Boyardee	65	3.4	0.9	3.2	1.1
Wonder	40	3.3	1.2	3.2	1.5
Hot Pockets	55	3.5	1.0	3.0	1.4
Trix	80	3.8	1.1	3.6	1.4
Pringles	100	4.0	1.1	3.9	1.3
Lucky Charms	100	4.0	1.1	3.8	1.4
Dole	65	3.4	0.9	2.9	1.4
Auntie Anne's	85	4.0	1.1	3.7	1.3
<b><i>Non-food brands</i></b>					
Samsung	60	3.1	0.7	2.2	1.1
Yahoo	70	3.6	1.0	3.0	1.5
Harley Davidson	35	2.9	0.8	2.6	1.1
Colgate	80	3.5	0.8	2.7	1.3
Dawn	75	3.2	1.2	2.4	1.1
Nerf	90	4.4	0.8	4.3	1.1
Facebook	95	3.2	1.1	2.5	1.1
Target	95	3.9	0.8	3.4	1.1
Bounty	80	3.0	1.2	2.4	1.2
Playstation	60	3.6	1.3	3.1	1.5
Johnson & Johnson	15	2.8	1.3	2.0	0.9
Comcast	55	3.5	1.2	2.9	1.5
NBC	95	3.2	1.0	2.3	1.3
Abercrombie & Fitch	15	2.6	0.9	1.7	0.8
Oral B	65	3.1	1.0	2.4	1.2
Ebay	75	3.7	1.0	3.1	1.3
Bing	40	3.2	1.0	2.8	1.4
Visa	50	3.2	1.0	2.5	1.1
Sony	90	3.7	1.1	3.1	1.5
Crayola	100	4.1	1.1	4.1	1.2
NFL	90	3.3	1.4	3.1	1.6
AT&T	90	3.4	1.2	3.0	1.5
Nintendo	90	4.3	0.9	4.2	1.3

MTV	25	2.9	1.1	2.5	1.4
Lowe's	95	3.1	1.1	2.8	1.2
BMW	35	2.9	1.2	2.5	1.4
Elmer's	100	3.1	0.9	2.4	1.1
Gap	80	3.5	0.9	2.8	1.4
ty	70	4.0	1.1	3.7	1.1
Mattel	15	3.4	1.0	2.9	1.3
American Eagle	35	3.3	1.2	2.7	1.5
Barbie	90	2.4	1.2	1.9	1.3
IBM	15	2.8	1.0	2.6	1.3
Apple	100	3.9	1.1	3.3	1.4
Little Tikes	100	3.1	1.1	2.3	1.3
Match Box	55	3.4	1.0	3.0	1.4
Charmin	45	2.6	1.0	1.9	0.9
Pampers	75	2.2	1.3	1.8	1.1
Playskool	55	3.4	1.1	2.5	1.4
Teen Nick	60	3.7	1.2	3.7	1.2
Lego	100	4.1	1.0	3.9	1.1
Toys "R" Us	90	4.0	1.0	3.8	1.3
Hanes	30	2.9	1.0	1.9	1.1
Hasbro	55	3.2	1.1	3.1	1.3
USPS	95	3.6	0.8	3.0	1.5
Webkinz	65	3.8	1.0	3.9	1.4
Fisher-Price	75	3.3	1.2	2.7	1.5
3M	20	3.4	1.0	2.8	1.4
Google	95	3.8	0.9	3.3	1.4
ESPN	65	3.2	1.3	3.1	1.4
Canon	45	3.7	1.0	3.1	1.5
Ziploc	95	3.2	1.1	2.8	1.4
American Express	30	3.3	1.0	2.9	1.4
Microsoft	90	3.8	1.1	3.3	1.5
T-Mobile	50	3.6	1.0	2.8	1.5
Verizon	90	3.8	1.0	3.3	1.5
Nike	90	3.4	1.1	3.2	1.6
Ikea	30	3.3	1.1	2.7	1.4
Adidas	30	3.4	0.9	2.8	1.5
Tide	75	3.4	1.0	3.2	1.4
hp	50	3.3	1.1	2.8	1.4
UPS	85	3.7	0.9	3.2	1.5
Kleenex	70	3.4	0.9	3.1	1.4



Scrubbing Bubbles	85	3.8	0.9	3.3	1.5
Twitter	70	3.3	0.9	3.2	1.5
Intel	25	3.2	0.8	2.7	1.3
Walt Disney	100	4.2	1.1	4.3	1.2
Ford	80	3.6	1.0	3.4	1.4
Glad	40	3.5	1.0	2.9	1.5
Warner Brothers	80	3.5	0.9	3.2	1.5
Dell	75	3.7	0.8	3.1	1.4
Master Card	75	3.6	1.0	2.9	1.4
Xbox	80	4.3	1.0	4.3	1.0
Philadelphia Eagles	80	3.5	1.2	3.0	1.7
FedEx	95	3.2	0.9	2.9	1.3
Honda	80	3.3	1.0	3.1	1.4
Lysol	45	3.1	0.9	2.7	1.3
Walmart	100	3.9	1.1	3.5	1.4
Best Buy	85	3.8	0.9	3.4	1.4
Sears	90	3.3	0.9	3.1	1.2

## 2.4 - Discussion



Previous studies have shown that the way choices are presented can alter preference through the “framing effect”<sup>15</sup>. Kaiyo was created with this technique in mind. Previous researchers have found that child consumption can be increased with use of a spokes character, by increasing appetite, frequency of wished for consumption, and anticipated buying preference. While celebrity characters are most successful, novel spokes characters have shown success as well<sup>50</sup>. Orth and Malkewitz found that brands targeting children should have exciting themes featuring contrasting designs, which gave the basis for major features of the Kaiyo design<sup>38</sup>.

Hypothesis 1 was partially supported. As hypothesized, brand familiarity was low for Kaiyo at 0% of children rating Kaiyo as familiar. However, children did not rate liking for Kaiyo as high on either the happiness or excitement scale, with happiness showing a neutral rating and excitement showing a rating on the low end of neutral. These results suggest that children perceived Kaiyo as neutral on emotional valence, but were somewhat bored by the brand. Limitations of Study 2 included self-reported responses, a small sample size, higher proportion of children in lean category than overweight category, and lack of both geographic and ethnic diversity. Self-reported responses can differ from reality, causing skewed results. Additionally, since 75% of children were lean, these results cannot be assumed for children across all weight profiles. These results cannot be used to define the population of 7-9 year-olds across the country since all participants were white and from central Pennsylvania. If a brand were to be tested for national use in the future, this study could be adapted to include a larger number of participants of different ethnicities and who are from different regions of the country.

### *Changes That Were Made to Kaiyo as a Result of the Pilot Study*

Several changes were made to the Kaiyo logo as a result of this pilot study and can be seen in Figure 2. A neutral rating for both emotional and excitement tests was desired for study 3 to avoid confounding factors in results. To do so, Kaiyo did not need to be adjusted for emotional characteristics, but did need to be improved for excitement. Children had responded well to other brands that used red, bold, capitalized font, so those features were added to the logo. An example of this liking can be seen with 3M. Only 20% of children recognized this brand, but excitement levels were  $2.8 \pm 1.4$ . 3M uses a simple, bold, red font and received a neutral rating despite lack of familiarity. Changes to Kaiyo were piloted informally among members of the laboratory, but were not piloted on another group of children prior to proceeding with the study. Results of this study could have been further strengthened by testing the new logo with children for familiarity, happiness, and excitement. Major food companies not only test their brands with children before releasing it to the market, but many also use child focus groups to understand the needs and desires of their target age range. They base marketing techniques off age, gender, socioeconomic status, and many other factors<sup>49</sup>. With more time, resources, and funding, this study could have been strengthened through use of focus groups and specification for demographic characteristics.

**Figure 2. Kaiyo Logo Designs**

	
Study 2 Logo	Study 3 Logo

### Study 3 - Primary Study to Determine the Impact of Branding on Laboratory Test-Meal Intake in Children

#### 3.1 - Methods

##### *Subjects*

This study sought to test 30 children ages 7-9. To date, a total of seven children  $8.2 \pm 1.3$  years old have been tested. Five were male, two were female. Six children were Caucasian, one child was Hispanic/ Latino. Four were lean, while three were overweight. Children had body fat percentage of  $23.6 \pm 8.0$  and BMI z-score of  $0.1 \pm 1.1$ . These children were recruited from the community around The Pennsylvania State University, and participated in the study with a parent or legal guardian. Parents gave written informed consent for their child's participation and children gave verbal assent. The study was approved by the Institutional Review Board of The Pennsylvania State University.

**Table 3. Study 3 Demographics**

<b>Sex</b>	<b>% (n)</b>
% Male	71.4 (5)
% Female	28.6 (2)
<b>Ethnicity</b>	
% White	85.7 (6)
% Not-white	14.3 (1)
<b>Weight status</b>	
% Lean (BMI% = 0-85)	57.1 (4)
% Overweight (BMI % = 85-100)	42.9 (3)
	<b>Mean <math>\pm</math> SD</b>
<b>Age</b>	$8.2 \pm 1.3$
<b>Body fat %</b>	$23.6 \pm 8.0$
<b>BMI z-score</b>	$0.1 \pm 1.1$

### ***Screening***

Screening criteria required participants to be right-handed and be reading at or above grade level without any learning disabilities or color-blindedness. Participants were also required to have English as their native language and be users of the television and internet according to parental report. Additionally, children were required to be healthy and without major food allergies. In addition, no one in the immediate family could have been diagnosed with psychiatric illness, such as depression, anxiety, or bipolar disorder. For the fMRI portion of this study, participants were screened for metal devices in the body, injuries involving metal objects, body piercings, and claustrophobia in small spaces.

### ***Experimental Design***

Participants completed 3 test sessions featuring 3 different meal conditions: plain packaging, branded packaging, and Kaiyo packaging. The order in which children received these meal conditions was randomized and counter-balanced across participants. These visits occurred in the Metabolic Kitchen and Children's Eating Behavior Laboratory in 311 Chandlee Laboratory of The Pennsylvania State University during which the following protocols were performed. These visits usually occurred between 5pm and 7pm during the week or 11am and 1pm on the weekend. Researchers worked with families to coordinate similar meal times for all three visits within subject. A fourth visit following the test meals used Functional Magnetic Resonance Imaging (fMRI) to explore physiological brain response to the brand images that were piloted and developed in Study 2. This portion of the study will be published in a later paper.

### ***Questionnaires***

Parents and children completed questionnaires on Qualtrics Survey Software. Parent questionnaires included the Infant Feeding Questionnaire, Child Eating Behaviour Questionnaire<sup>53</sup>, Parent Ad Survey, Parent Brand Inventory, and questions on basic demographics. The Infant Feeding Questionnaire gathered data on maternal nutrition during pregnancy and breastfeeding.

It also gathered data on how the child was fed in the first twelve months of life. The Child Eating Behaviour Questionnaire explored triggers to consumption in the child as well as determinants of food choice and attitudes about food. The Parent Ad Survey was used to gain home environment information about the child in regards to where they may be exposed to advertisements, such as television and internet. The Parent Brand Inventory asked how familiar the child was with brands previously seen in Study 2. Children answered the Impulsivity Questionnaire, Kid's Activity Questionnaire, Children TV and Internet Questionnaire, Loss of Control Questionnaire (developed by Marian Tanofsky-Kraff, unpublished data 2014), and Food Frequency Questionnaires. The Impulsivity Questionnaire was used to determine impulsiveness of the child in a variety of scenarios. This impulsivity rating would be later analyzed alongside acceptance of novel brands. The Kid's Activity Questionnaire gathered data on frequency of physical activity as well as sedentary activity of the child. The Children TV and Internet Questionnaire was used to understand amount of time children were spending watching TV and using the internet as well as understand what channels and websites they were viewing/visiting. The Loss of Control Questionnaire gathered information on control during consumption of a meal as a measure of the child's potential for binge eating. The Food Frequency Questionnaire was used to determine types of foods consumed as well as consumption frequency. These questionnaires can be seen in the Appendix.

### ***Anthropometrics***

Height and weight were measured and recorded. Both were taken twice and an average was recorded. Children were weighed using an electronic scale, Tanita HD-351, in light clothing and stocking feet without a coat or jacket. Weight was recorded to the nearest 0.1 lb. Height was measured on a stadiometer to the nearest 0.1 cm. Height and weight were used to calculate Body Mass Index (BMI) by converting height and weight to meters and kilograms and applying the equation  $BMI = kg/m^2$ . Body fat percentage was recorded using a Tanita Body Composition

Analyzer BF-350 and was recorded to the nearest 0.1%. For this, children were barefoot and in light clothing.

***Food Preparation: Meal***

The following food items seen in Table 4 were prepared according to packaging instructions prior to each visit. Each item was packaged in clear plastic containers with lids in the following amounts per serving. Children could gain as many servings in this quantity as they wished. Depending on the condition, these containers were covered with either brand name stickers, plain white stickers, or Kaiyo stickers to mimic packaging they would find in the grocery store or their home. Condition order for the three visits was randomized for participants. Once foods were measured out, pre-weights of each item were taken to the nearest 0.01g and recorded on participant data sheets. Food items were measured in plastic containers without lids, while beverages were measured in plastic containers with lids to account for potential spillage.

**Table 4. Food Items Presented in Test-Meals**

<b>Food Item</b>	<b>Quantity</b>
Kraft® Macaroni and Cheese	1 cup (220g)
Green Giant® Mixed Vegetables*	½ cup (85g)
Mott's® Original Applesauce	½ cup (140g)
Pringles® Original Potato Chips	16 chips (30g)
Keebler® Chips Deluxe Chocolate Chip Cookies	3 cookies (50g)
Kool-Aid® Bursts Tropical Punch	6.75 oz (215g)
Nesquik® Low-Fat Chocolate Milk	8 oz (255g)

\*During this study, Green Giant® Mixed Vegetables brand went out of business, so we kept the same label, but replaced the product with a comparable product.

***Food Preparation: Liking & Preference Test***

Seven clear 1-ounce soufflé cups with lids were prepared before each meal session. These were labeled with smaller versions of the same packaging used in the meal condition. Within each soufflé cup was a sample of each meal item for the child to taste and rate. Approximate amounts provided are stated in Table 5.

**Table 5. Approximate Weight of Food Items Offered in Liking & Preference Test**

<b>Food Item</b>	<b>Quantity*</b>
Kraft® Macaroni and Cheese	3g
Green Giant® Mixed Vegetables	4g
Mott's® Original Applesauce	8g
Pringles® Original Potato Chips	2g
Keebler® Chips Deluxe Chocolate Chip Cookies	5g
Kool-Aid® Bursts Tropical Punch	5g
Nesquick® Low-Fat Chocolate Milk	5g

\*Difference in gram amount between food items is due to difference in food density

**Figure 3. Liking & Preference Test Packaging as Seen in Branded Condition**

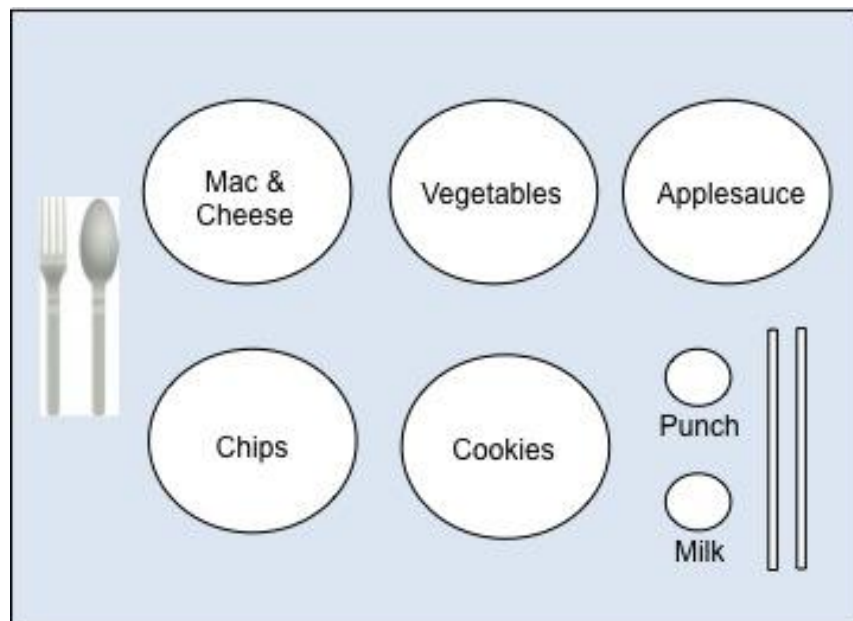




### *Meal Presentation*

Food items were presented to participants with the same placement on a standard blue tray in each meal session. This placement can be seen in Figure 3. Presentation featuring packaging design can be seen in Figures 5, 6, and 7.

**Figure 4. Presentation Format Used for Test-Meals**



**Figure 5. Familiar Brand Meal Packaging**



Figure 6. Plain Meal Packaging



Figure 7. Kaiyo Brand Meal Packaging



### ***Testing Procedures: Food Liking & Preference Test***

Using the samples in the soufflé cups, participants completed a food liking and preference test. Children were asked to eat one bite-size sample at a time and take a sip of water between each tasting. Children rated liking of each sample using a 5-point hedonic categorical smiley face scale ranging from super bad to super good. Following this, children ranked the 7 foods from most favorite to least favorite to determine preferences for foods at the meal.

### ***Testing Procedures: Fullness Measures***

Children used a visual analog fullness scale named “Freddy” to rate fullness before and after the test-meal<sup>54</sup>. This scale used a character with a sliding scale to mark how full children were before and after consumption of the test meal. A script was read to children as a training tool for this sliding scale. Children were taught that having the bar at the bottom of the scale meant that they were very hungry and they had an empty belly. They were taught that having the bar at the top of the scale meant that they were so full that they could not eat one more thing. A question was administered following this lesson to test understanding, “If you just finished eating and you aren’t hungry anymore, but could probably fit one more cookie in your stomach, where would you put the bar on the Freddy scale?” Upon a correct response of placing the bar near the top of the scale with about an inch to spare, children were asked to use Freddy to show researchers how full their stomach currently felt. After the visit, children’s ratings were measured from the bottom of the scale to the nearest 1/16<sup>th</sup> inch to quantify their response.

### ***Testing Procedures: Meals***

Children were presented with the test meal according to their assigned condition. They had a maximum of 30 minutes to complete the meal and were instructed to eat as much or as little as they wished. They were able to ask for additional servings of any of the food items. If they asked for an additional serving, the researcher brought them another serving of the same quantity in the same packaging. Researchers read a non-food related book to the child to serve as a

consistent, neutral distraction. After the child self-reported that they were done with their meal, all food items were again weighed and recorded to the nearest 0.01g.

### ***Variables of Interest***

To determine impact of differing package designs, difference in food weight and calories consumed in the different package conditions were the primary variables of interest.

Additionally, correlations between impulsivity from the Impulsivity Questionnaire and consumption of the differing conditions were tested to determine impulsivity influence on intake.

### ***Statistical Analysis***

Data from all seven initial participants were used for the final analysis. Data were analyzed using SPSS for Windows, Version 20.0. All statistical tests were computed at a critical value of  $p \leq 0.05$ . Descriptive statistics were used to describe participants in terms of BMI, gender, ethnicity, and demographics. Participants were classified by BMI percentage as normal weight or overweight with percentage over 85 classifying as overweight and percentage under 85 classifying as normal weight. Categorical statistics were taken for consumption in calories and weight (g). Spearman statistics were used to study correlations among the brand condition, intake, liking rating, BMI, gender, and various additional variables. T-tests were used to compare meal intake and liking across the three conditions. Additional T-tests were used to compare impulsivity to BMI z-score and liking of food items in the novel brand condition.

### 3.2 - Results

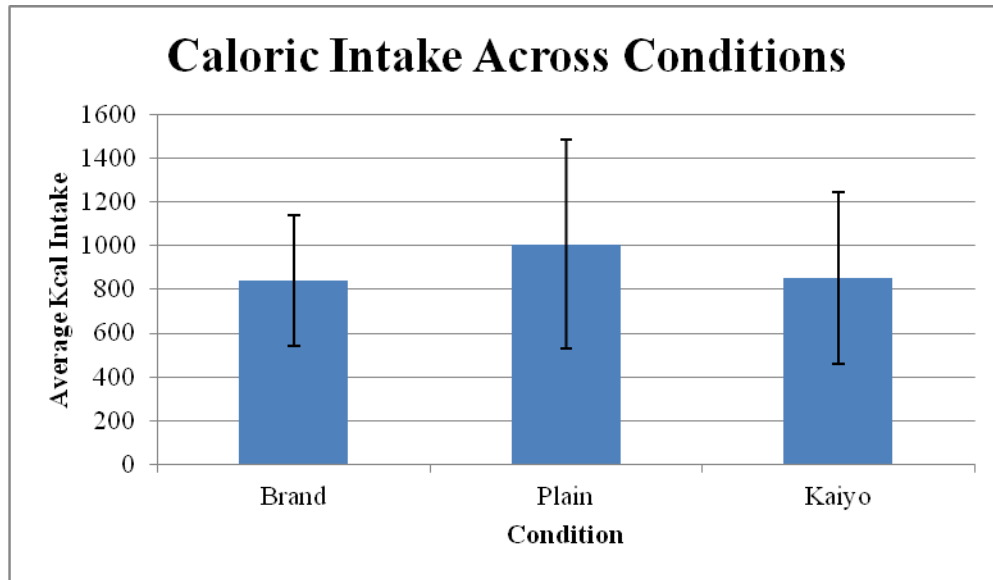
#### *Intake*

Average child intake at the meal was  $840.2 \pm 299.5$  kcals at the branded condition,  $1006.8 \pm 480.0$  kcal in the plain condition, and  $853.6 \pm 393.5$  kcal in the Kaiyo condition. There were no significant differences in caloric consumption seen overall or within individual food items among the three meals. Additional information on food item and overall meal intake can be seen in Table 6. Differences in caloric intake between meal conditions are represented graphically in Figure 8.

**Table 6. Study 3 Intake (kcal)**

	Mean $\pm$ SD		
Food Item	Branded	Plain	Kaiyo
Mac and Cheese	$300.3 \pm 290.9$	$416.8 \pm 478.6$	$250.9 \pm 369.5$
Vegetables	$14.3 \pm 18.5$	$8.2 \pm 16.0$	$16.2 \pm 20.3$
Applesauce	$98.5 \pm 91.0$	$88.2 \pm 68.0$	$80.4 \pm 74.7$
Chips	$151.2 \pm 61.5$	$166.1 \pm 44.0$	$215.8 \pm 94.1$
Cookies	$199.5 \pm 174.9$	$245.1 \pm 159.8$	$209.8 \pm 153.8$
Punch	$20.9 \pm 13.8$	$14.7 \pm 7.8$	$12.4 \pm 9.4$
Chocolate Milk	$55.5 \pm 112.6$	$67.6 \pm 97.0$	$68.0 \pm 94.2$
Total	$840.2 \pm 299.5$	$1006.8 \pm 480.0$	$853.6 \pm 393.5$

**Figure 8. Mean Caloric Intake at the Three Branded Conditions**



**Brand: (840.2 ± 299.5). Plain: (1006.8 ± 480.0). Kaiyo: (853.6 ± 393.5).  $F(df\ 2,6) = 0.57$ ;  $p = 0.58$ .**

Energy consumed in the plain meal condition was positively correlated with sex of the child (Spearman's  $\rho = 0.79$ ;  $p = 0.03$ ). Independent samples t-tests showed that females ate more than males ( $t = -1.6$ ;  $p = 0.003$ ). Females consumed  $1542.0 \pm 646.5$  kcal in the plain condition, while males consumed  $792.7 \pm 201.5$  kcal in the plain condition. Energy consumed in the plain meal condition was also positively correlated to the amount of time, in minutes, children ate (Spearman's  $\rho = 0.96$ ;  $p = 0.001$ ), percent of kcal consumed from protein at the meal (Spearman's  $\rho = 0.86$ ;  $p = 0.01$ ), and weight status of overweight vs. non-overweight (Spearman's  $\rho = 0.87$ ;  $p = 0.01$ ). Overweight children ate more from this condition than non-overweight children ( $t = -1.9$ ;  $p = 0.04$ ). Overweight children ate  $1363.0 \pm 552.3$  kcal, while non-overweight children ate  $739.7 \pm 188.0$  kcal. Additionally, energy consumed in the plain meal condition was positively correlated with two answers on the parent questionnaire: "If my child were allowed, they would eat too much" (Spearman's  $\rho = 0.81$ ;  $p = 0.03$ ) and "if given the

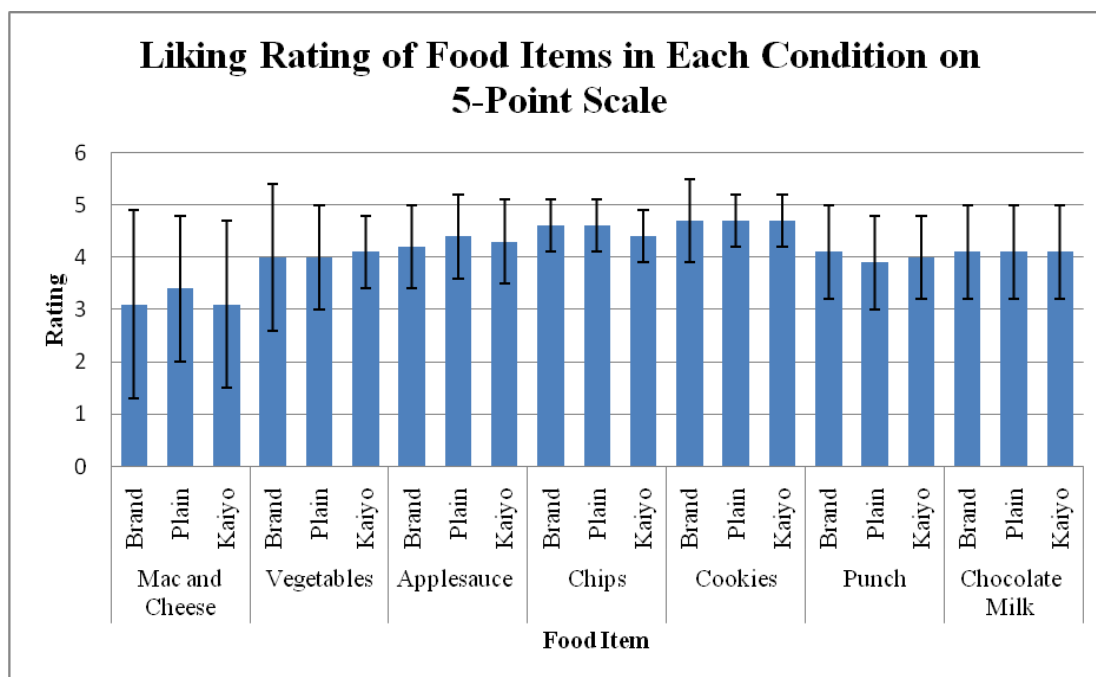
chance, my child would drink continuously throughout the day” (Spearman’s  $\rho = 0.81$ ;  $p = 0.03$ ).

Kcal consumed in the Kaiyo condition were positively correlated with these same two questions at (Spearman’s  $\rho = 0.81$ ;  $p = 0.03$ ) and (Spearman’s  $\rho = 0.81$ ;  $p = 0.03$ ) respectively. Kcal consumed in the Kaiyo condition were also negatively correlated with percent of kcal from carbohydrates in this meal condition (Spearman’s  $\rho = -0.82$ ;  $p = 0.02$ ). None of these correlations seen in the plain or Kaiyo meal were seen in the branded meal.

### *Liking*

There was no significant difference in liking rating of any of the food items used in the test meal from one condition to the next. There was also no significant difference in average rating across meals from one condition to the next. Mac and cheese received the lowest average rating, while cookies received the highest. Average liking rating for each food item within each condition can be seen in Figure 9.

**Figure 9. Liking Rating of Food Items in Each Condition on 5-Point Scale**



### *Impulsivity*

Child impulsivity score was negatively related to child BMI z-score (Spearman's  $\rho = -0.76$ ;  $p = 0.05$ ). In addition, children's liking rating for chips labeled with Kaiyo was negatively associated with impulsivity (Spearman's  $\rho = -0.81$ ;  $p = 0.03$ ). Kaiyo chip rating and BMI z-score decreased as impulsivity score increased. Within this study, an increasing impulsivity score means children are less impulsive, thus, results actually show a positive correlation between impulsivity and BMI z-score as well as increasing rating of chips in the Kaiyo condition. These relationships can be seen in Figures 10 and 11.

**Figure 10. BMI Z-Score in Relation to Impulsivity Score**

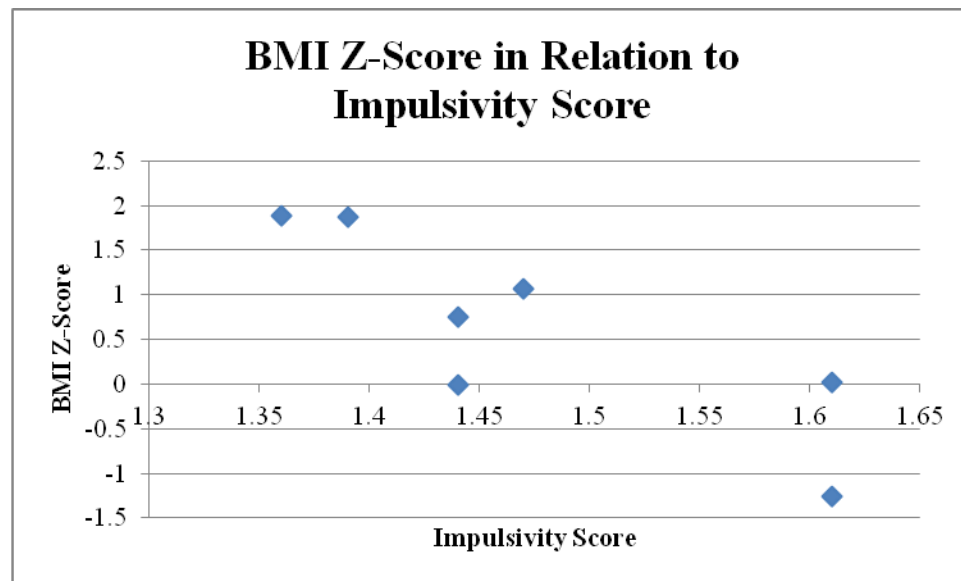
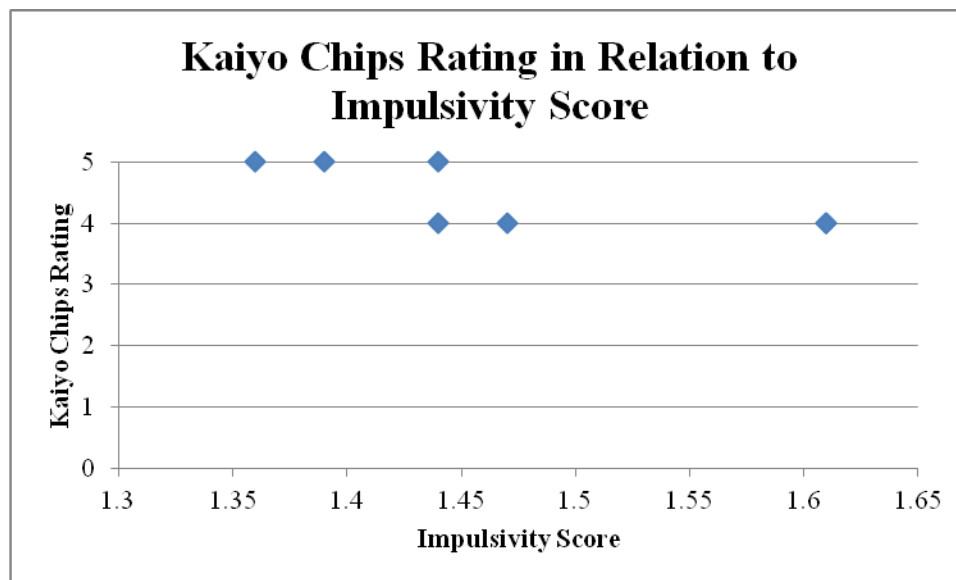




Figure 11. Kaiyo Chips Rating in Relation to Impulsivity Score



### 3.3 - Discussion

#### *Consumption*

Previous studies have shown that exposure to a brand on multiple occasions creates an attachment similar to an interpersonal relationship<sup>42,43</sup>. Repetition, along with associative conditioning, alters preference and choice and causes a consumer to favor a specific brand<sup>10,11,13,14,35</sup>. This is reflected in a study by Boyland et al. that found that 6-13 year-old children who had a history of television brand exposure were more heavily influenced by interaction with a television food ad than children who were new to the world of advertising<sup>21</sup>. Because of this previous literature, children were hypothesized to prefer familiar brands in this study and consume most in that condition.

Previous studies have also found significant correlations between branding and consumption. Keller's study of 43 children ages 4-6 years old showed that overweight children showed a greater response to food branding, and within studies they tended to consume more calories from a branded condition than plain condition. On the other hand, healthy weight children consumed less from the branded than the plain<sup>33</sup>. However, a study of 65 children ages 3-5 years old found that a greater percentage of children chose food in bright packages rather than familiar brand packages<sup>48</sup>.

Hypothesis 2 was not supported by this study. Caloric consumption was greatest in the plain condition, as opposed to the predicted familiar branded meal; however, none of the differences were significant across conditions. At this time, these data neither support nor conflict with previous research that shows significant differences between meal conditions to favor packaging featuring a familiar or novel brand, primarily because the study lacked sufficient power for these analyses. These previous studies had larger sample sizes and worked with

younger children, which could account for why they found significant differences in consumption and we did not.

### ***Liking***

Branding has been shown in previous studies to increase food preference and liking, especially in children. McClure et al. found that taste preferences differ between branded and blind taste-tests in a study of 67 adults <sup>45</sup>. Additionally, Robinson et al. conducted a study with 63 children 3-5 years old that found a significant relationship between packaging design featuring a McDonald's ® logo and higher liking for a food product <sup>18</sup>. Kotler et al. also identified in his study of 343 children 2-6 years old that both liking and food choice are higher for food items featuring a known and liked character <sup>51</sup>.

However, in our study, there were no significant differences in liking rating of any of the food items used in the test meal from one condition to the next. There were also no significant differences in average rating across meal conditions. This again does not reflect previous literature, likely due to smaller sample size.

### ***Impulsivity***

Unlike hypothesis 2, hypothesis 3 was partially supported. As risk-taking, or impulsivity, increased in children, so did rating of liking for the chips in the Kaiyo condition. While it is unusual that this was not seen across other food items, it may still represent an association between impulsivity and willingness to try novel foods. It is possible that some foods, particularly highly palatable snack foods like chips, might be more responsive to novel branding than other healthier foods, especially since children have a genetic taste predisposition to prefer sweet and salty <sup>28</sup>. Additional studies with more participants are needed to confirm this. Results of impulsivity correlating with BMI z-score further support findings in 109 children 10-18 years old showing that overweight children have higher impulsivity than normal weight children <sup>55</sup>.

### ***Strengths and Weaknesses***

Strengths of this study included lab measures of intake, observational measures of BMI and other demographic information, 100% participant retention, and novel brand that had been previously pilot tested. Individuals are not always accurate with estimating their energy consumption, which is why lab measures of intake are favored over questionnaires. Laboratory assessment of body weight and height is also favored over self-report because individuals often misreport these values. Retention at 100% was represented by all 7 participants coming to all 3 of the meal sessions. Kaiyo had been previously tested first amongst members of the laboratory and again in Study 2 before being used as the novel food brand in Study 3, which supported the design as an unfamiliar character that evoked neutral emotion in children.

This study had limitations of a small sample size and lack of ethnic diversity. At this time, only 7 participants have been included in this study, while other studies that have found significant correlations between branding and consumption or liking had a minimum of 40 participants. These results cannot be used to define the population of 7-9 year-olds across the country since 85.7% of participants were white and all were from central Pennsylvania.

### ***Future Directions for This Study***

As this study gains more participants, findings that should be further explored are the correlations between energy consumed in the plain meal condition and child sex, meal time, percent of kcal consumed from protein, weight status of the child, and specific questionnaire responses. Additional findings to explore are correlations between energy consumed in the Kaiyo meal condition and percent of kcal from carbohydrate consumed, and the same specific questions from the plain condition. These two questions: “If my child were allowed, they would eat too much” and “If given the chance, my child would drink continuously throughout the day” when combined with other responses can give information about food responsiveness and desire to drink, respectively. If later responses show correlations between the other questions in these

categories, more meaningful relationships can be identified than the current relation simply to two questions. Furthermore, the primary correlates should be reexamined: kcal and liking across meal conditions as well as impulsivity rating in regards to these measures.

## **Conclusion**

Hypothesis 1 was partially supported by this study. In Study 2, children rated Kaiyo familiarity at 0%, rated emotional response at a neutral value, and rated excitement response at a bored value. The brand was adjusted before entering Study 3. Hypothesis 2 was not supported by this study; children did not consume significantly more energy from foods in any of the three conditions. Hypothesis 3 was partially supported. While children with higher impulsivity did not have a higher energy intake of the novel brand, there was a significant correlation between impulsivity and rating of chips in the Kaiyo condition.

More research is needed to understand the way in which brands influence children and the individual characteristics that influence children's response to branding. Impulsivity may be one of these characteristics, but more studies are needed to confirm why. Additional research is needed in other age groups and geographic locations. As we gain more knowledge in this area, we will have a better understanding of food choice and obesity in children, and may better be able to develop interventions that increase consumption of healthy food items for this population.

## Appendix: Questionnaires Administered to Parents and Children in Qualtrics

### Children's TV Survey

Instructions: The scientist will read these questions for you and after each question, they will give you a choice of answers. Pick the best answer.

1. Do you watch television (TV)? Yes:\_\_\_\_\_ No:\_\_\_\_\_
2. If you watch TV, can you remember about how many hours per day you watch TV?
  - a. about 1 hour
  - b. about 2 hours
  - c. about 3 hours
  - d. about 4 hours
  - e. more than 4 hours
3. Can you tell me how many TVs are in your home? \_\_\_\_\_
4. Do you have a TV in your bedroom? Yes:\_\_\_\_\_ No:\_\_\_\_\_
5. When you watch TV, do you watch the commercials? Yes:\_\_\_\_\_ No:\_\_\_\_\_
6. What do you think commercials are for? There is no wrong answer. \_\_\_\_\_
7. Do you watch TV during dinner? Yes:\_\_\_\_\_ No:\_\_\_\_\_
8. Please tell me if you watch these TV Channels:

	Yes	No	Not sure/ I don't know
Nickelodeon			
Disney Channel			
Cartoon Network			
ABC			
CBS			
NBC			
PBS			
FOX			
Discovery Channel			
Animal Planet			
TLC			
MTV			
VH1			
CW			
ESPN			

9. Tell me what you know about the following shows:

	Never heard of it	Heard of it but never seen it	Seen it a few times	Watch it a lot
Spongebob Squarepants				
The Adventures of Jimmy Neutron				
Shake It Up				
iCarly				
Drake and Josh				
Fanboy and ChumChum				
Hannah Montana				
Wizards of Waverly Place				
Degrassi				
Jessie				
Victorious				
The Fairly Oddparents				
A.N.T. Farm				
Power Rangers				
Supah Ninjas				
The Penguins of Madagascar				
Austin and Ally				
Arthur				
House of Anubis				
Good Luck Charlie				
American Idol				
Wipeout				
Phineas and Ferb				
Big Time Rush				
The Electric Company				
Sports Programs (basketball, football, or other sports)				
America's Funniest Home Videos				

10. Do you watch other any other TV shows that we did not talk about? Can you remember what they are?

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## Infant Feeding Questionnaire

The following questionnaire is part of a research study being done at Penn State University looking at the relationship between infant feeding practices and childhood eating and obesity. Please answer the questions in this survey to the best of your ability. In question #1, you will be asked to report whether you (a) mainly breast-fed your child or (b) mainly formula-fed your child. Please answer this question with the method you remember using most often in your child's first year, even if you did both. After answering question #1, go to questions #2-24 if you marked (a), or skip to questions #25-47 if you marked (b). Thank you for your participation.

**1. How did you feed your child during the first year (12 months) of their life?**

- a. Mainly breast- fed (Continue to Q#2)
- b. Mainly formula- fed (Skip to Q#25)

**If you chose "Mainly breast-fed" for question #1, continue to Q # 2. Otherwise, skip to Q# 25:**

**2. How many months was breast- milk *the only* way you fed your child?**

- a) Less than 1 month
- b) 1 – 3 months
- c) 4 – 6 months
- d) More than 6 months
- e) Don't remember

**3. Did you smoke while breast-feeding?**

- a) Yes
- b) No

**4. Did you consume alcohol when breast-feeding?**

- a) Yes
- b) No

**5. Did you feed your child formula while breast-feeding?**

- a) Yes (Continue to Q#6)
- b) No (Skip to Q#10)

**If "yes" to Q#5, continue to Q#6. Otherwise, skip to Q #10:**

**6. How old was your child when you first fed him or her formula?**

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

**7. How many months was your child fed breast milk and formula at the same time?**

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

**8. How many months total did you feed your child formula?**

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

**9. When you fed your child formula, what type of formula did you feed your child?**

- a) Milk- based formula (like Enfamil LIPIL, Similac Advance, and Good Start Supreme )
- b) Soy- based formula (like Enfamil ProSobee, Isomil, and Good Start Supreme Soy)
- c) Hydrolysate formula (like Nutramigen, Pregestamil, and Alimentum)
- d) Other, please list \_\_\_\_\_

**10. How many months total did you breast-feed your child (including the time you were also giving them formula)?**

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

**11. Did you pump breast milk and feed your child this milk from a bottle?**

- a) Yes (Continue to Q#12)
- b) No (Skip to Q#16)

**If "yes" to Q#11, go to Q. 12. Otherwise, skip to Q# 16:**

12. How old was your child when you first pumped breast milk?

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) Older than 6 months
- e) Don't remember

13. When you started to give your child pumped breast milk, how often did your child get milk in this form (pumped milk in a bottle)?

- a) Less than 1 time per day
- b) 1 time a day
- c) 2 times a day
- d) 3 times a day or more
- e) Don't remember

14. How often did your child finish his or her bottle of breast milk?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

15. How often did you encourage your child to finish all of his or her bottle?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

16. When breastfeeding, how often did your child let go of the breast by him or her-self?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

17. How old was your child when you stopped breastfeeding, including pumping breast-milk?

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

18. How old was your child when you first fed them juice?

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) More than 6 months
- e) Don't remember

19. How old was your child when he or she was first given solid foods (eg. baby food or cereal)?

- a) 1-3 months
- b) 4-6 months
- c) 7-9 months
- d) Older than 9 months
- e) Don't remember

20. What solid food did your child eat first?

- a) Infant cereal
- b) Pureed fruits (eg. peaches, pears, bananas, etc.)
- c) Pureed vegetables (eg. carrots, green beans, potatoes, etc)
- d) Pureed sweet foods (eg. puddings, ice cream, etc)
- e) Don't remember

If you can remember any of the foods your child liked when he/she was a baby, can you please list them:

21. How did your child first react to solid foods?

- a) Liked very much
- b) Neutral (Neither liked nor disliked)
- c) Disliked very much
- d) Refused to eat it at first.
- e) Don't remember

22. During the time when you were weaning your child from the bottle or breast, how often did they eat solid foods?

- a) Less than once a day
- b) Once a day
- c) Twice a day
- d) 3 or more times a day
- e) Don't remember

23. Currently, how willing is your child to try new foods?

- a) Very unwilling to try new foods
- b) Unwilling to try new foods
- c) Neutral (Neither willing or unwilling)
- d) Moderately willing to try new foods
- e) Very willing to try new foods

24. Does your child have any food allergies?

- a) Yes, please list \_\_\_\_\_
- b) No

If you circled in question #1 that you mainly breast-fed your child and have answered the above questions you are finished with this part of the survey and do not need to answer questions #25-47..

**If you chose (b) “Mainly formula-fed” on question #1, begin here:**

25. How old was your child when you first fed him or her formula?

- a) Birth
- b) Less than 1 month
- c) 1-3 months
- d) 4-6 months
- e) Don’t remember

26. What type of formula did you mainly feed your child?

- a) Milk- based formula (like Enfamil LIPIL, Similac Advance, and Good Start Supreme )
- b) Soy- based formula (like Enfamil ProSobee, Isomil, and Good Start Supreme Soy)
- c) Hydrolysate formula (like Nutramigen, Pregestamil, and Alimentum)
- d) Other, please list \_\_\_\_\_

27. Why did you choose this type of formula to feed your child?

- a) My child liked it
- b) It was the least expensive and/or easiest to get
- c) My child had food allergies and needed it
- d) Other reasons, please list \_\_\_\_\_
- e) Don’t remember

28. Did you feed your child any other type of formula?

- a) Yes (Continue to Q#29)
- b) No (Skip to Q#31)

**If “yes” go to Q#29, if “no” skip to Q #31:**

29. What other types of formula did you feed your child?

- a) Milk- based formula (like Enfamil LIPIL, Similac Advance, and Good Start Supreme )
- b) Soy- based formula (like Enfamil ProSobee, Isomil, and Good Start Supreme Soy)
- c) Hydrolysate formula (like Nutramigen, Pregestamil, and Alimentum)
- d) Other, please list \_\_\_\_\_

30. Why did you change formulas?

- a) Didn’t like the first formula
- b) Was allergic to the first formula
- c) Doctor recommendation
- d) Availability or price
- e) Other, please list \_\_\_\_\_

31. Did you breast-feed your child for any period of time?

- a) Yes (Continue to Q#32)
- b) No (Skip to Q#38)

32. How often did you smoke while breastfeeding?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

33. How often did you consume alcohol while breastfeeding?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

34. About how many weeks did you breast- feed your child before giving them formula?

- a) Less than 1 week
- b) 2-4 weeks
- c) 4-6 weeks
- d) More than 6 weeks
- e) Don’t remember

35. Did you pump breast milk and feed your child this milk from a bottle?

- a) Yes (Continue to Q#36)
- b) No (Skip to Q#38)

36. (If “yes” to Q#35) How old was your child when you first pumped milk?

- a) Less than 1 month
- b) 1-3 months
- c) 4-6 months
- d) Older than 6 months
- e) Don’t remember

37. How many weeks total did you breast- feed your child (including the time you may also have been giving them formula)?

- a) Less than 1 week
- b) 2-4 weeks
- c) 4-6 weeks
- d) More than 6 weeks
- e) Don't remember

38. How many months total was your child fed formula?

- a) 3 months
- b) 4-6 months
- c) 7-9 months
- d) 10-12 months
- e) More than 12 months

39. How often did your child drink all of his or her bottle of formula?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

40. How often did you encourage your child to finish all of his/her bottle?

- a) Never
- b) Rarely
- c) Sometimes
- d) Often
- e) Always

41. How old was your child when you first fed them juice?

- a) 1 -3 months
- b) 4-6 months
- c) 7-9 months
- d) Older than 9 months
- e) Don't remember

42. How old was your child when he or she was first exposed to solid foods (baby foods)?

- a) 1-3 months
- b) 4-6 months
- c) 7-9 months
- d) Older than 9 months
- e) Don't remember

43. What solid food did your child eat first?

- a) Infant cereal
- b) Pureed fruits (eg. peaches, pears, bananas, etc.)
- c) Pureed vegetables (eg. carrots, green beans, potatoes, etc)
- d) Pureed sweet foods (eg. puddings, ice cream, etc)
- e) Don't remember

If you can remember any of the foods your child liked when he/she was a baby, can you please list them:

---

44. How did you child first react to solid foods (baby foods)?

- a) Liked very much
- b) Neutral (Neither liked nor disliked)
- c) Disliked very much
- d) Refused to eat it at first.
- e) Don't remember

45. During the time when you were weaning your child from the bottle, how often did they eat solid foods (baby foods)?

- a) Less than once a day
- b) Once a day
- c) Twice a day
- d) 3 or more times a day
- e) Don't remember

46. Currently, how willing is your child to try new foods?

- a) Very unwilling to try new foods
- b) Unwilling to try new foods
- c) Neutral (Neither willing or unwilling)
- d) Moderately willing to try new foods
- e) Very willing to try new foods

47. Does your child have any food allergies?

- a) Yes, please list \_\_\_\_\_
- b) No

Age (Parent): \_\_\_\_\_  
Weight (Parent): \_\_\_\_\_  
Height (Parent): \_\_\_\_\_

1. What is the highest level of education you have completed?

- a) Junior high school
- b) High school or G.E.D.
- c) Technical school
- d) College
- e) Advanced degree

2. During your child's first year (12 months) of life what was your marital status?

- a) Single
- b) Not married but living with the baby's mother/ father
- c) Married
- d) Living with extended family
- e) Other, please explain:  
\_\_\_\_\_

3. Where did you usually buy food from during your child's first year (12 months) of life?

- a) Supermarket
- b) Bodega/ convenient store
- c) Farmer's market
- d) W.I.C.
- e) Other, please list: \_\_\_\_\_

4. How often does your family eat fruit?

- a) Every day
- b) Most days of the week (4-6)
- c) A few days a week (2-3)
- d) Less than once a week
- e) Rarely, less than once a month

5. How often does your family eat vegetables?

- a) Every day
- b) Most days of the week (4-6)
- c) A few days a week (2-3)
- d) Less than once a week
- e) Rarely, less than once a month

Mother's Food Preferences

Which of the following foods do you remember eating while you were pregnant or when your child was young (age 1 year or less)? Please circle the foods you remember eating during this time.

Broccoli	Eggs	Sandwich bread
Brussels sprouts	Buttermilk	Pasta
Carrots	Parmesan cheese	Rolls
Celery	Blue/Roquefort cheese	Cakes
Corn	Sharp cheddar cheese	Pies/ pastry
Cabbage	Swiss cheese	Cheesecake
Green beans	Plain yogurt	Doughnuts
Peas	Steak (beef)	Cookies
Spinach/ greens	Ham-/Cheeseburger	Brownies
Tomatoes	Tacos	Muffins
Squash	Hot dog	Ice cream
Mushrooms	Pork/ ham	Frozen yogurt
Peppers	Bacon	Milkshake
Legumes (e.g. kidney beans)	Chicken	Caramel
Potato (white)	Fried Chicken	Puddings
Sweet potato/ yams	Turkey	Custard
Onions/ scallion	Ground meat	Jello (flavored)
Radishes	Sausage	Hard candy
Turnips	Fish (white fish)	Cotton candy
Sour Pickles	Shellfish (shrimp)	Milk chocolate
Garlic	Salmon	Dark chocolate
Hot Peppers	Fried Fish	Marshmallows
Apples/ applesauce	Pizza	Black coffee
Apricots	Garlic/Cheese Bread	Coffee with cream/ milk
Bananas	Chinese Takeout	Regular soda
Berries	Mozzarella Sticks	Diet soda
Lemons/Limes	French Fries	Caffeinated drinks
Orange/ tangerine	Onion Rings	100% fruit juice
Grapefruit	Potato Chips	Kool-aid
Peaches/ nectarines	Tortilla Chips	Iced Tea (sweetened)
Pears	Pretzels	Iced Tea (unsweetened)
Plums	Popcorn with butter	Milk (whole fat)
Grapes	Popcorn without butter	Milk (low-fat or skim)
Mango	Nachos	Chocolate Milk
Melons	Biscuits	Hot Chocolate
Pineapple	Cinnamon Rolls	Beer or other alcohol
Avocado	Rice	Snapple
Peanut Butter	Pancakes or Waffles	Gatorade
	Cereal	Lemonade

Are there any other foods you can remember eating while you were pregnant or when your child was young (age 1 year or less) that were not listed on the previous page? Please list them here:

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### Child Eating Behaviour Questionnaire (CEBQ)

Please read the following statements and tick the boxes most appropriate to your child's eating behaviour.

	Never	Rarely	Some -times	Often	Always
My child loves food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more when worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child has a big appetite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child finishes his/her meal quickly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child is interested in food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child is always asking for a drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child refuses new foods at first	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats slowly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats less when angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child enjoys tasting new foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats less when s/he is tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child is always asking for food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more when annoyed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If allowed to, my child would eat too much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more when anxious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

My child enjoys a wide variety of foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child leaves food on his/her plate at the end of a meal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child takes more than 30 minutes to finish a meal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Never	Rarely	Some -times	Often	Always
Given the choice, my child would eat most of the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child looks forward to mealtimes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child gets full before his/her meal is finished	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child enjoys eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more when she is happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child is difficult to please with meals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats less when upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child gets full up easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more when s/he has nothing else to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Even if my child is full up s/he finds room to eat his/her favourite food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If given the chance, my child would drink continuously throughout the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child cannot eat a meal if s/he has had a snack just before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If given the chance, my child would always be having a drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



My child is interested in tasting food s/he hasn't tasted before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child decides that s/he doesn't like a food, even without tasting it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If given the chance, my child would always have food in his/her mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My child eats more and more slowly during the course of a meal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Parent's Ad Survey

**Instructions: Please read the following questions and answer them to the best of your ability.**

1. Do you watch television (TV)? Yes:\_\_\_\_\_ No:\_\_\_\_\_
2. If you watch TV, about how many hours per day you watch TV?
  - a. about 1 hour or less
  - b. about 2 hours
  - c. about 3 hours
  - d. about 4 hours
  - e. about 5 hours or more
3. How many TVs are in your home? \_\_\_\_\_
4. When you watch TV, do you watch the commercials? Yes:\_\_\_\_\_ No:\_\_\_\_\_
5. Do you watch TV during dinner? Yes:\_\_\_\_\_ No:\_\_\_\_\_
6. What 5 TV networks do you watch most often (e.g. ABC, NBC)?
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
  5. \_\_\_\_\_
7. Do you use the Internet at home? Yes:\_\_\_\_\_ No:\_\_\_\_\_
8. If you use the Internet at home, about how many hours per day do you use the Internet at home?
  - a. about 1 hour or less
  - b. about 2 hours
  - c. about 3 hours
  - d. about 4 hours
  - e. about 5 hours or more
9. What 5 websites do you visit most often (e.g. google, yahoo)?
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
  5. \_\_\_\_\_
10. How many computers are in your home? \_\_\_\_\_
11. How many times per week does your family usually go to the grocery store?
  - d. 1 time/week or less
  - e. 2 times/week
  - f. 3 times/week
  - g. 4 times/week
  - h. 5 times/week or more
12. Does your child come along with you when you go to the grocery store?
 

Yes:\_\_\_\_\_ Sometimes:\_\_\_\_\_ No:\_\_\_\_\_

### Impulsivity Questionnaire

I am going to read some questions to you. After each question, I would like you to say “YES” or “NO” based on how you feel. There are no right or wrong answers or trick questions. Try not to think that much about what the questions mean, just do your best. Okay?

	YES	NO
1. Would you enjoy water skiing?		
2. Do you have a hard time sitting still?		
3. Do you often want more excitement?		
4. Do you prefer to eat foods you know rather than trying new ones?		
5. Would you feel sorry for a lonely stranger in a group?		
6. Do you enjoy taking risks?		
7. Would you like to be a rock star?		
8. Do you get very interested in your friend's problems?		
9. Do you save your money?		
10. Would you like to jump out of a parachute?		
11. Do you worry about how animals feel?		
12. Do you often buy things that you don't need?		
13. Would you prefer an exciting job with travel and adventure to an office job?		
14. Do unhappy children who feel sorry for themselves annoy you?		
15. Do you often do or say things without stopping to think?		
16. Would you like to own an adventure playground?		
17. Do you feel sorry for children who are very shy?		
18. Do you often get into trouble because you do things without thinking?		
19. Would you enjoy betting your own money if you had the chance to win more?		
20. Do you think it is silly for people to cry when they are happy?		
21. Do you do your homework quickly without doublechecking the answers?		
22. Do you like diving off the high-dive?		
23. Do you get happy when your friends are happy, or sad when your friends are sad?		
24. Has anyone ever told you that you are impulsive?		
25. Do you like when new things happen, even when they are frightening and strange?		
26. When one of your friends is upset, do you get upset too?		
27. Do you usually think carefully before you do something?		
28. Would you like to learn to fly an airplane?		
29. Do you ever get really involved with how a character in a movie or book feels?		
30. Do you often do things at the last minute?		
31. Do you like to take chances?		
32. Do you get very upset when you see someone cry?		
33. Do you sometimes break rules?		
34. Do you act very carefully when you are in a new situation?		
35. Does it make you laugh when you see others in a group laughing?		
36. Do you often say things without thinking about them?		
37. At an amusement park, do you like the darts and side shows better than you like the roller coasters and bumper cars?		
38. Do you get worried when others around you are worried?		
39. Do you get involved in things and then later wish you could get out of them?		
40. Do you like to take changes?		
41. When your friends talk about their problems, do you try to change the subject?		
42. Do you get so excited about new projects that you don't think about possible		

problems you might run into?		
43. Even though you could fall and get hurt, would you like to climb a mountain?		
44. Do you get bored easily?		
45. Would you like to travel to exciting places?		
46. Can you understand why some people get upset so easily?		
47. Do you think that planning ahead takes the fun out of things?		
48. Do you sometimes like doing things that are a little frightening?		
49. Do you stay happy even when your friends are upset about something?		
50. Is it hard for you to stay out of trouble?		
51. Would a life with no danger be too boring for you?		
52. Would a life with no danger be too boring for you?		
53. Would you avoid doing something if it is dangerous?		
54. Do you prefer getting into a swimming pool slowly to diving straight in?		
55. Are you often surprised at how people react to what you do or say?		
56. Do you get very annoyed if someone keeps you waiting?		
57. Would you enjoy skiing very fast down a steep mountain?		
58. Do you like watching people open presents?		
59. Would you prefer an unexpected trip to one that was planned for a while?		

### Kid's Activity Questionnaire

**Instructions:** Please fill in the box for each question. Answer for both the question about the school year and summer.

During the school year	Never	Less than once in 7 days	1-2 times in 7 days	3-5 times in 7 days	6-7 times in 7 days
How many times do you swim?					
How many times do you ride your bike?					
How many times do you go bowling?					
How many times do you play soccer?					
How many times do you play basketball?					
How many times do you play baseball or softball?					
How many times do you go hiking?					
How many times do you go fishing?					
How many times do you go running or jogging?					
How many times do you play tennis?					
How many times do you play football?					
How many times do you play volleyball?					
How many times do you play golf?					
How many times do you go mountain climbing or rock climbing?					
How many times do you ride your scooter?					
How many times do you ride your skateboard?					
How many times do you go in-line roller skating?					
How many times do you go snowboarding?					
How many times do you go skiing?					
How many times do you play video games?					

How many times do you watch TV?					
How many times do you use the computer?					
How many times do you play outside at recess?					
How many times do you play inside at recess?					
<b>During the school year</b>	<b>Never</b>	<b>Less than 30 minutes a day</b>	<b>30 minutes – 1 hour a day</b>	<b>1-2 hours a day</b>	<b>More than 2 hours a day</b>
How much time do you spend doing homework?					
How much time do you spend riding a bus?					
How much time do you spend riding in a car?					
<b>During the summer</b>	<b>Never</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>
How many times do you swim?					
How many times do you ride your bike?					
How many times do you go bowling?					
How many times do you play soccer?					
How many times do you play basketball?					
How many times do you play baseball or softball?					
How many times do you go hiking?					
How many times do you go fishing?					
How many times do you go running or jogging?					
How many times do you play tennis?					
How many times do you play football?					
How many times do you play volleyball?					
How many times do you play golf?					
How many times do you go mountain climbing or rock climbing?					
How many times do you ride your scooter?					
How many times do you ride your skateboard?					
How many times do you go in-line roller skating?					

How many times do you go snowboarding?					
How many times do you go skiing?					
How many times do you play video games?					
How many times do you watch TV?					
How many times do you use the computer?					
How many times do you play outside at recess?					
How many times do you play inside at recess?					
<b>During the summer</b>	<b>Never</b>	<b>Less than 30 minutes a day</b>	<b>30 minutes – 1 hour a day</b>	<b>1-2 hours a day</b>	<b>More than 2 hours a day</b>
How much time do you spend doing homework?					
How much time do you spend riding a bus?					
How much time do you spend riding in a car?					

### Loss of Control - ED Screening Questionnaire

Please answer “Yes” or “No” to the following questions by putting an “X” in the appropriate box.

While you were eating...	Yes	No
1. During the past 3 months have you ever felt that you were not able to stop eating, or not able to control the type of food or amount of food that you ate?		

If you answered “Yes” – Please continue below. If you answered “No” – STOP – turn in your form.

2. How many times did this happen:

a. In the past month? \_\_\_\_\_ Times

b. 2 months ago? \_\_\_\_\_ Times

c. 3 months ago? \_\_\_\_\_ Times

(If you can't remember, please give your best guess)

Answer the following questions based on the *last time* you felt like you lost control or were unable to stop eating.

Before you started eating:	Yes	No
3. Were you hungry?		
4. Were you trying to cut back or eat less food than usual?		
5. Did you have a bad feeling, like angry, sad, or lonely before you ate?		
6. Were you feeling bored or tired before you ate?		
7. Did something bad happen to make you want to eat? (For example: Had a fight with a friend, got in trouble with a parent)		
8. Did something good happen to make you want to eat? (For example: Did well on a test went to a party or celebration)		
9. Did you keep eating even though you were full or had already eaten enough?		
10. Did the amount of food feel like too much for you at the time?		
11. Do you think other people would think you ate too much food?		
12. Were you eating in secret or trying to hide the food you were eating?		
13. Did it feel like you were eating more than others?		
14. During any time when you were eating, did you feel numb or like you spaced or zoned out?		

After you finished eating:	Yes	No
15. Did you feel badly about yourself for eating or about what you ate? For example, did you feel guilt, shame, unhappiness, or another kind of bad feeling?		
16a. Did you throw up?		
16b. If yes, did you make yourself throw up?		
17. Did you use laxatives or any kind of pills to make the food go out of your body?		
18. Did you exercise for an hour or more, in order to make up for the food that you ate?		
19. Did you not eat anything at all for a whole day or more because you ate too much?		



### Kid's Food Frequency Questionnaire

**Instructions:** Please fill in the box for each question. Answer all of the questions for each food group.

How often do you eat...

<b>Breads and Grains</b>	<b>Never eat this</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>	<b>More than 7 times in 7 days</b>
White bread						
Dark bread						
Cooked cereal, such as oatmeal						
Rice						
Macaroni and cheese						
Spaghetti and tomato sauce						
Pizza						
<b>Vegetables</b>	<b>Never eat this</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>	<b>More than 7 times in 7 days</b>
Carrots						
String beans						
Peas						
Corn						
Baked potato						
Mashed potatoes						
Baked beans						
<b>Fruits</b>	<b>Never eat this</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>	<b>More than 7 times in 7 days</b>
Apple						
Applesauce						
Banana						
<b>Dairy</b>	<b>Never eat this</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>	<b>More than 7 times in 7 days</b>
Skim milk						
Whole milk						
Ice cream						
<b>Protein</b>	<b>Never eat this</b>	<b>Less than once in 7 days</b>	<b>1-2 times in 7 days</b>	<b>3-5 times in 7 days</b>	<b>6-7 times in 7 days</b>	<b>More than 7 times in 7 days</b>
Beef, such as hamburger						
Pork chops, steaks,						

roast						
Fish, such as fried flounder						
Chicken						
Chicken based soup						
Tomato based soup						
Scrambled eggs						
Peanut butter						
Beverages	Never eat this	Less than once in 7 days	1-2 times in 7 days	3-5 times in 7 days	6-7 times in 7 days	More than 7 times in 7 days
Tea						
Fruit drinks						
Soft drinks						
Snacks						
Potato chips						
Corn chips/ Doritos						
Popcorn						
Desserts	Never eat this	Less than once in 7 days	1-2 times in 7 days	3-5 times in 7 days	6-7 times in 7 days	More than 7 times in 7 days
Muffin						
Cookie						
Doughnut						
Pie						
Chocolate						
Other candy without chocolate						
Miscellaneous foods	Never eat this	Less than once in 7 days	1-2 times in 7 days	3-5 times in 7 days	6-7 times in 7 days	More than 7 times in 7 days
Tomato ketchup						
Salad dressing						
Butter						
Mayonnaise						
Brown gravy						
Syrup						

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## ACADEMIC VITA

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### Education

#### **Pennsylvania State University**

Bachelor of Science in Nutrition, Minor in Business and Liberal Arts  
Schreyer Honors College  
Expected Graduation: May 2014, University Park, PA

### Honors and Certifications

- Lillian VanDyke Scholarship in Nutrition
- President's Freshman Award
- Child Abuse, Mandated Reporter Training
- ServSafe Certification
- Human Subjects Research Certification
- Lab Hazard Communication Certification

### Association Memberships/Activities

- Student Nutrition Association, President 2012-2013
- HealthWorks Peer Health Education Program, Team Leader
- HIV Prevention Counselor
- Mount Nittany Medical Center, Nutrition Department Volunteer
- Academy of Nutrition and Dietetics

### Professional Experience

#### **Penn State Cooperative Extension, Montgomery County**

May 2013 – August 2013

*Intern*

Collegeville, PA

- Developed seven cooking preparation and nutrition lesson plans for children ranging from 3 to 12 years of age.
- Taught interactive nutrition and cooking lessons to children where they gained knowledge about assembling healthy foods in the kitchen and the importance of a healthy diet and physical activity.

#### **Pennsylvania State University**

University Park, PA

**Nutrition Department, Research Assistant, Honors Thesis**

May 2012 – Present

- Exploring the relationship between food cues, in the form of branding influences, and children's consumption of a test meal.
- Studying children's food choice in relation to novel, familiar, and control branding designs.
- Designing novel brand packaging using Adobe Photoshop.



**Simmons Dining Commons, Crew Member**

January 2011 – May 2011

- Performed food preparation.
- Practiced proper food handling and serving methods.

**Communications Department, Research Assistant**

September 2010 – December 2010

- Studied the way humans respond to different levels of emotional support when experiencing an inner conflict.

**Nutritional Health Systems**

May 2012 – August 2012

*Intern*

King of Prussia, PA

- Designed nutrition newsletter for use in schools.
- Prepared meal plans for weight loss, athletes, and eating disorders.

**Ridge Support Technologies**

May 2012 – August 2012

*Marketing Assistant*

Pottstown, PA

- Contributed to marketing effort through social media: Facebook and Tumblr.

**AmerisourceBergen Corporation**

Seasonally May 2011 – January 2012

*File Clerk*

Chesterbrook, PA

- Assisted with file organization and development and performed a variety of secretarial duties.