

# Portraying physical activity in food advertising targeting children

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Jessica Castonguay

*The University of Arizona, Tucson, Arizona, USA and  
The University of Pennsylvania, Philadelphia, Pennsylvania, USA*

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## Abstract

**Purpose** – Childhood obesity is a serious health concern (World Health Organization (WHO), 2013) and advertising exposure is known to be a contributing factor (Institute of Medicine (IOM), 2006). In recent years consumers have expressed an increased interest in products appearing healthy and food companies have committed to changing their child-targeted marketing practices to promote a healthy lifestyle. The purpose of this paper is to examine depictions of physical activity in food advertising and assess how recognition of a promoted food's healthy and unhealthy traits influences dietary selections among youth in Southern Arizona in the USA.

**Design/methodology/approach** – A content analysis of food advertisements aired during 2009-2013 ( $n = 534$  and 354, respectively) identified changes to child-targeted food marketing messages. A structured interview determined differences in recognition of "juxtaposed beliefs" (i.e. that are contradictory and both healthy and unhealthy e.g. connecting exercise with a food high in sugar) among younger children, five to six years of age ( $n = 34$ ) and older children, ten to 11 years of age ( $n = 34$ ). Children were offered snacks to determine how this ability to recognize juxtaposition related to their dietary selections.

**Findings** – There has been an increase in the frequency with which physical activity is depicted in advertisements for high-sugar foods. When presented with such advertising, a greater number of older than younger children recognized juxtaposed beliefs. Those younger children who showed recognition were more likely to select the advertised item, although this was not the case with older children.

**Research limitations/implications** – The findings from this research relate to children's responses to advertisements for sugared cereal that depict physical activity and may not be generalizable further.

**Practical implications** – Children who are able to recognize both the healthy and unhealthy aspects of food are paradoxically likely to find it more appealing. Given the increased practice of associating high-sugar foods with physical activity in child-targeted food marketing, this raises concerns for nutrition education strategies, and the regulation of food marketing to children.

**Originality/value** – Little research has examined the depiction of physical activity in food marketing targeting children, nor children's ability to recognize, and react to, juxtaposed beliefs regarding a product's healthfulness.

**Keywords** Attitudes, Eating, Marketing, Advertising, Children, Obesity, Beliefs

**Paper type** Research paper

## Introduction

Childhood obesity has become one of the most serious public health concerns of the Twenty-First Century (World Health Organization (WHO), 2013), particularly in the USA (Wang and Lobstein, 2006). Exposure to food advertising has been established as a contributing factor (Institute of Medicine (IOM), 2006). Indeed, most foods advertised during children's television programming are high in fat, sugar, and/or sodium (Kunkel *et al.*, 2014). Despite this, as of 2012 the US Centers for Disease Control (CDC) (2013) was able to report that childhood obesity had decreased among very young and at-risk populations.

Study 1 includes data from a larger study funded by the Robert Wood Johnson Foundation.



While the changes were quite small and only appeared in 19 US states and territories, this finding is encouraging, suggesting some public health efforts may be working. Among these efforts are voluntary changes to food and beverage marketing (Kolish and Peeler, 2008).

There has recently been a rise in marketing that appeals to consumers' interest in products that appear healthy (Institute of Medicine (IOM), 2010; Nestle, 2002). Members of the food and beverage industries have even asserted their desire to promote children's well-being by depicting a healthy lifestyle in their marketing messages (Kolish and Peeler, 2008). While these efforts seem at odds with the finding that the nutritional quality of foods promoted to children remains poor (Kunkel *et al.*, 2014), research is yet to examine how these efforts have changed the content of child-targeted food advertising. Furthermore, the impact that using "health" as a marketing message has on young viewers' dietary selections is in need of investigation.

One way advertisers associate a product with health is by portraying physical activity (Folta *et al.*, 2006; Gantz *et al.*, 2007). Unfortunately, depictions of physical activity are often used to promote nutritionally poor products (Castonguay *et al.*, 2013). Thus, critics fear that pairing a food high in elements such as added sugar with a health-related message can encourage excessive consumption of unhealthy foods (Lewin *et al.*, 2006; Mikkelsen *et al.*, 2007). Nevertheless there has been little research into the use and behavioral effects of this marketing strategy on children of different ages.

#### *The aims of this research*

This research assesses child-targeted food advertising that depicted physical activity. Study 1 compares food advertisements aired in 2009 and 2013 to explore changes in the prevalence of advertisements that depict physical activity. The types of foods promoted alongside physical activity are documented to provide a context for assessing the potential that changes in this marketing practice contributed to the minor improvements in childhood obesity rates reported by the CDC (2013). Study 2 then investigates how understanding of this advertising tactic is associated with product selections of different age children. This information is intended to provide insight as to how this marketing strategy may be contributing to, rather than deterring, childhood obesity.

#### *Review of the literature*

American children view almost five hours of television commercials per week (Rideout *et al.*, 2010), many of which promote foods and beverages (Kunkel *et al.*, 2014; Gantz *et al.*, 2007). Exposure to such advertising appears to be influencing children's dietary preferences and health. In an assessment of 120 empirical studies, the IOM (2006) found strong evidence that exposure to food advertising has the intended effects of increasing children's requests for advertised foods. Indeed, a mere ten to 30 second exposure to advertising has been shown to influence preschoolers' short-term preferences for specific food items (Borzekowski and Robinson, 2001), demonstrating how influential these messages can be on young children. The more a child views advertising, the more likely he or she is to request-specific products from parents (Chamberlain *et al.*, 2006). Regardless of whether parents succumb to their child's request or a child is able to purchase the product alone, children who are exposed to more food advertising are increasingly likely to consume the products they see promoted (Andreyeva *et al.*, 2011).

In addition to preferences and requests, the IOM (2006) concluded that there is strong evidence that televised food advertising influences children's short-term consumption of promoted products and ultimate weight status. As marketing strategies evolve, research is needed to assess the use of new tactics and children's understanding and response to novel marketing strategies.

*Content of advertisements.* The most common foods promoted on children's television are fast foods and sugared cereals (Yale Rudd Center for Food Policy and Obesity, 2013). Sugared cereal advertising appears to be particularly problematic, as child-targeted cereals have more sugar than cereals targeted to adults (Schwartz *et al.*, 2008). The United States Department of Agriculture (2010) recommends that Americans two years of age and older limit the intake of added sugars to no more than 40 grams per day, yet many cereals contain more than ten grams of sugar per serving. Cereal companies also spend more on advertising to children than do other food companies (Botha *et al.*, 2008). The specific techniques used to promote these high-sugar cereals to children are in need of investigation.

One tactic marketers use to promote high-sugar cereals, among other products, is to convey healthy lifestyle messages. Though healthfulness is rarely the primary focus of child-targeted food advertisements (Kunkel *et al.*, 2009), general references to health are indeed common (Gantz *et al.*, 2007). As of 2011, health-related messages appeared in more than half of child-targeted food advertisements on television (Castonguay *et al.*, 2013).

In recent years, members of the food and beverage industries in the USA have joined a self-regulatory program called the Children's Food and Beverage Advertising Initiative (CFBAI) (Kolish and Peeler, 2008; Peeler *et al.*, 2009). Members of the CFBAI have pledged to promote healthier foods and a healthy lifestyle to children through their advertising campaigns. These efforts were underway by 2008 (Kolish and Peeler, 2008). Thus, one may expect that depictions of a healthy lifestyle, such as participation in athletic activities, would increasingly appear in child-targeted food advertising in the years following the development of the CFBAI.

As of 2011, depictions of physical activity appeared in 17.7 percent of child-targeted food advertisements on television. Though the inclusion of physical activity in advertising is often praised by the food and beverage industry for encouraging children to get fit (Kolish and Peeler, 2008), there is cause for concern that many of these depictions appear in promotions for items of poor nutritional value. For years, McDonald's associated its products with physical activity by appointing Ronald McDonald a "Fitness Ambassador," yet the company continued to market chicken nuggets and fries to children. Similarly, Kraft Foods promised to emphasize physical activity on product labels, but continued to promote products high in fat and sugar (Lewin *et al.*, 2006). These products are not recommended to be consumed to enhance exercise performance, yet are frequently associated with increased strength and endurance in advertisements, leading to criticism of this practice.

Study 1 therefore explores depictions of physical activity in child-targeted food advertising. Specifically, changes in this marketing practice over time are investigated. Advertising depicting physical activity in 2009 and 2013 are compared. The study assesses changes over time in the frequency that depictions of physical activity appear in child-targeted food advertising, the food products most frequently associated with physical activity in child-targeted food advertising, and the nutritional quality of the products associated with physical activity in child-targeted food advertising.

*The effects of advertisements.* Contrary to popular perception, health-related information has been shown to increase a product's appeal to children (Dixon *et al.*, 2013; Lapierre *et al.*, 2011; Levin and Levin, 2010; Soldavini *et al.*, 2012). Health messages can be informative, even encouraging healthy dietary selections (Bannon and Schwartz, 2006; Peterson *et al.*, 1984). However, when associated with products of low nutritional value, some fear that such messages may actually encourage consumption of obesogenic foods (Lewin *et al.*, 2006; Mikkelsen *et al.*, 2007).

The pairing of foods with physical activities may be a particularly influential marketing practice. Indeed, children are able to identify physical activity at an early age (Hesketh *et al.*, 2005) and express an interest in selecting foods thought to enhance exercise performance (Holsten *et al.*, 2012; O'Dea, 2003). Several studies have even found that children prefer products labeled as healthful (Lapierre *et al.*, 2011; Soldavini *et al.*, 2012). However, similar studies have found inconsistency between subgroups within the samples examined (Dixon *et al.*, 2013; Levin and Levin, 2010).

While these studies have investigated children's responses to products that could be interpreted as either healthy or unhealthy, Dorey and McCool (2009) presented children with advertising that portrayed athletes while promoting McDonald's Happy Meals, which children clearly recognized as an unhealthy food. The ten to 12-year old participants in this research recognized the contrast between a food they knew to be unhealthy and sports that they perceived as good for them. They expressed dislike for this marketing tactic.

This suggests that by teaching children to recognize what makes a food healthy or unhealthy the promotional influence of this type of advertising can be averted. However, nutrition education programs often increase knowledge without improving dietary behaviors (Sharma, 2011). In fact, there is some research to suggest that increasing nutritional knowledge could make food advertising promoting an unhealthy food alongside a health-related message even more persuasive. Research with adults has shown that recognition of a potential health benefit of a generally unhealthy product increases its appeal (Andrews *et al.*, 2009; Kozup *et al.*, 2003).

For example, in a series of studies involving 594 participants, Cheong and Kim (2011) exposed young adults to advertising for tasty but unhealthy foods (termed "vice" products) and tasteless but healthy foods (termed "virtue" products). These products were promoted with either a consistent or discrepant appeal (tasty or healthy). Participants viewed an advertisement and were asked how consistent or discrepant they found the claims, as well as to evaluate the promoted food product. Responses indicated that young adults found the promotion of a "vice" food with a health claim, or "virtue" food with a taste claim, moderately discrepant. Though evaluations of "vice" foods were positive regardless of the advertising message, they were the strongest when a health message was used to promote the "vice" food. This suggests a persuasive effect from exposure to ads presenting juxtaposed messages regarding a product's healthfulness and is consistent with the schema pointer plus tag (SP + T) model (Graesser, 1981; Graesser *et al.*, 1980).

The SP + T model explains how individuals process information that is discrepant from their selected schema. The model suggests that instead of incorporating every detail of newly encountered information into memory, one simply chooses a schema consistent with as much information as possible but stores all discrepant information separately. Thus, a "pointer" indicates the selected schema while a "tag" marks the discrepant content.

For example, consider a young child first learning about penguins. The child likely has an existing schema for birds that includes having a beak, feathers, and the ability to fly. When first encountering a penguin, the child will likely be guided by this schema. However, when the child understands that penguins cannot fly, s/he will tag this trait as discrepant with the schema. When the discrepancy is perceived as mild, it is interpreted as unique and the newly encountered information is perceived positively. Thus, the child would have a positive impression of penguins. However, if the discrepancy is thought to be extreme, the newly encountered content is perceived negatively, i.e., the child is more likely to dislike penguins.

The SP + T model provides a guiding theoretical framework with which to explore children's responses to advertising promoting a nutritionally deficient product alongside depictions of physical activity. Children likely have an existing schema for healthy foods which includes those that assist with physical activity. However, high-sugar content is discrepant with this schema. If this discrepancy is mild, the SP + T model suggests that the resulting impact is an increased liking for a high-sugar food that is associated with physical activity.

*Developmental differences in responses to advertisements.* Though the basic principles of the SP + T model apply to children as well as adults, developmental differences must be considered to accurately assess how children will respond to juxtaposed beliefs. Unlike adults, young children do not always feel the need to ponder a resolution to discrepancies and instead simply ignore any seemingly paradoxical information (Jackson and Jacobs, 1982; Katsos and Bishop, 2011). Further, they often refuse to change their conclusions when presented with contradictory evidence, instead favoring consistency in beliefs (Waxer and Morton, 2011).

Donaldson and Westerman's (1986) seminal work detailed the age differences in children's responses to juxtaposed beliefs. Children were presented with a story in which a child both loved his pet and was angry at the pet for misbehaving. The responses of children aged four to 11 years were compared. The youngest simply replaced one belief (love) with the belief subsequently experienced (anger), and did not recognize that the first belief could continue to occur. However, by six years of age most children began to recognize multiple and competing beliefs, yet chose one trait to dominate. It was only after the age of eight years that children recognized multiple beliefs and struggled to reconcile the discrepancy, often vacillating back and forth between conclusions. By 11 years of age children still struggled with the paradox, but were aware that acknowledging one belief could bias perceptions of the other. This progression in one's ability to not only acknowledge but actually experience juxtaposed emotions has been revealed in more recent research (Larsen *et al.*, 2007; Zajdel *et al.*, 2013).

Overall, studies suggest that older children are likely to recognize juxtaposed beliefs and struggle to determine the best solution. Conversely, younger children can easily resolve any seeming discrepancies and often fail to even acknowledge juxtaposed beliefs. These age differences are evident in children's discussions of healthy eating. For example, Hesketh *et al.* (2005) assessed elementary school aged children's understanding of healthy eating. The children made statements such as "food with fat in it is unhealthy" but "we need some fat or you get too skinny," as well as "meat has iron" but "meat has fat in it" and "chips are healthy because they're potato and that's a vegetable, which is healthy" but "they have salt and fat so they're unhealthy." The younger children typically resolved their competing beliefs by favoring the positive

element and ignoring anything negative. For example, foods containing any natural products (such as potatoes) were considered healthy regardless of the final form of the product (such as fries or chips). Additionally, these children believed that eating fruit before junk food would counterbalance the effect. In contrast, ten-year old children did not definitively resolve their beliefs. Instead, they struggled to respond, often asking questions such as “I *walk* to the shop every day to buy hot chips – is that healthy or unhealthy?”

In sum, the SP + T model suggests that the recognition of juxtaposed beliefs regarding a promoted food’s healthfulness can increase the desirability of a product, as it is viewed as “unique.” Research with adults reveals that the pairing of an unhealthy food and health-related message is moderately discrepant and interpreted positively. However, research with older children suggests the opposite. While studies with young children have not directly examined responses to this pairing, they often fail to acknowledge juxtaposed beliefs at all. Further, they rarely find them bothersome. Thus, Study 2 investigates age differences in children’s recognition of juxtaposed beliefs when asked to assess a high-sugar product’s healthfulness following exposure to an advertisement for the product that implies it is healthy by depicting physical activity and the relationship between recognition of these juxtaposed beliefs and product selections when offered snack options.

## Study 1

### *Method*

*Sample.* This study, conducted in Southern Arizona in the USA, compares food advertisements appearing during children’s programming aired on the broadcast and cable networks that attracted the largest audiences for children’s programs during 2009 and 2013. Programs were considered children’s shows if they were rated TV-Y (appropriate for all children) or TV-Y7 (designed for children age seven and above) by the V-chip television rating system. Only programs that were aired between the hours of 7:00 a.m. and 10:00 p.m. were selected. For each channel, a composite weekday and weekend day was collected such that one episode of each children’s show that regularly airs on each of the networks sampled (ABC, CBS, Fox, NBC, CW, Cartoon Network, and Nickelodeon) was digitally recorded once over a three-month period during each year. This yielded 70.5 hours of children’s programming in 2009 and 55 hours of children’s programs in 2013. All food advertisements ( $n = 534$  and  $354$ , respectively) were examined by trained coders who applied the content-based measures explicated below.

*Measures.* The coding scheme for all measures was adapted from previous content analysis research that examined food marketing messages on television targeting children (Kunkel and Gantz, 1992; Kunkel *et al.*, 2009).

*Depiction of physical activity.* This variable was defined as the visual presentation of one or more individuals who are involved in sustained exercise that could increase the heartbeat substantially or cause sweating with extended duration. Brief or casual instances of people walking without a clear context of intentional physical activity were not included. This item was coded dichotomously as either the presence or absence of physical activity.

*Product type.* Each food commercial was categorized by product type. When necessary, information required to properly classify advertised products was obtained by consulting ingredient labels on products which were displayed on company web sites.

Categories included: sugared snacks; salted snacks; sugared beverages; sugared cereals; pastries/waffles; pasta; fast foods/restaurant foods; dairy; fruits/vegetables/100 percent fruit juice; protein; easy to prepare meals; pre-packaged lunches; and other. Applicable products were considered sugared snacks or sugared cereals if sugar was one of the first three ingredients listed. Drinks were considered sugared beverages if they included any added sugar. Protein included meat and meat-related products such as beef jerky. The Other category was reserved for products such as chewing gum, artificial sweeteners, and baby formula.

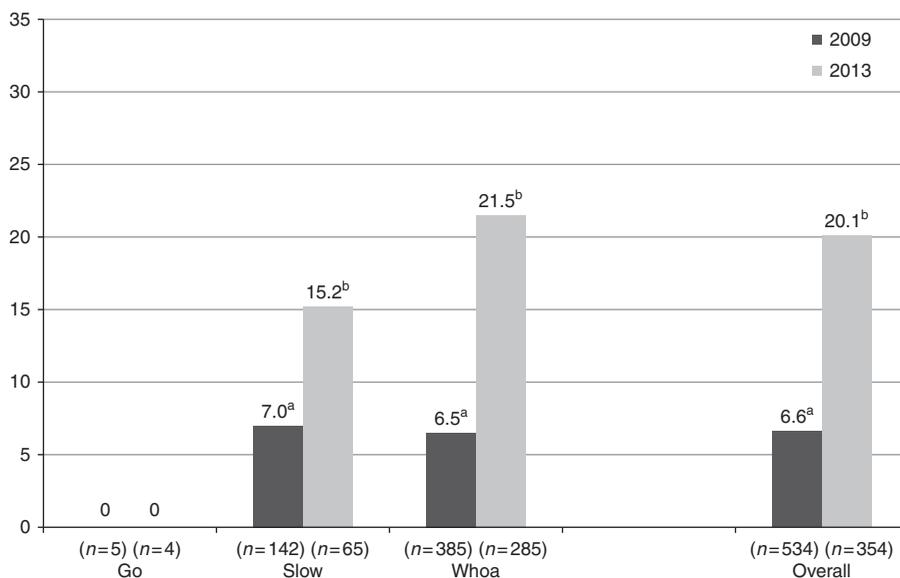
*Nutritional quality.* Finally, each advertisement was also categorized according to its fit with an evaluative food rating scheme devised by the United States Department of Health and Human Services (USDHHS) (2005) to help parents and children select a healthy diet. The centerpiece of the campaign is a food rating system that differentiates products in three categories: "Go"; "Slow"; and "Whoa." "Go" foods are products rich in nutrients and relatively low in calories, such as vegetables, fruits, and whole grain breads. They are low in fat and added sugar and therefore can be consumed as much as one may desire. "Slow" foods are higher in fat, added sugar, and calories than "Go" foods, and should be consumed "sometimes, at most several times a week" (USDHHS, 2005, p. 14). Examples include pasta, peanut butter, and sports drinks. "Whoa" foods, such as French fries, cookies, and fried chicken, are the highest in fat and added sugar. They should be consumed "only once in a while or on special occasions" and then only in small portions (USDHHS, 2005, p. 14). Thus, this coding scheme indicates a food's healthfulness based on the frequency the USDHHS (2005) recommends it to be consumed.

*Coding and reliability.* The classification of data were accomplished by a group of undergraduate students. All coders were trained for approximately two months and practiced extensively in order to achieve acceptable levels of inter-coder reliability before beginning the process of generating data. Reliability was assessed at the end of training and roughly once per week during the two-month period required to complete classification of cases during each year. A sub-sample of food advertising in randomly selected half-hour programs was evaluated by all coders and compared using Scott's pi to determine reliability coefficients. All variables examined achieved a level of reliability of 0.90 or above.

### Results

Study 1 investigated three issues. First, the frequency of child-targeted food advertising depicting physical activity was examined. Second, the food products most frequently associated with physical activity in child-targeted advertising were determined. Third, the nutritional quality of the food products associated with physical activity in child-targeted advertising was assessed. Changes in the use of this marketing tactic between 2009 and 2013 were analyzed using two sample  $z$ -tests for population proportions.

*Frequency.* The results of this research suggest that the rate physical activity is depicted in child-targeted food advertising has more than tripled. In 2009, physical activity was depicted in 6.6 percent of the 534 sampled food advertisements, increasing to 20.1 percent of the 354 sampled advertisements in 2013 ( $z = 6.08$ ,  $p < 0.001$ ) (see Figure 1). This could be a positive step in the fight against childhood obesity, depending on the types of foods being promoted with this tactic. Thus, changes to the types of products promoted with physical activity between 2009 and 2013 were investigated.



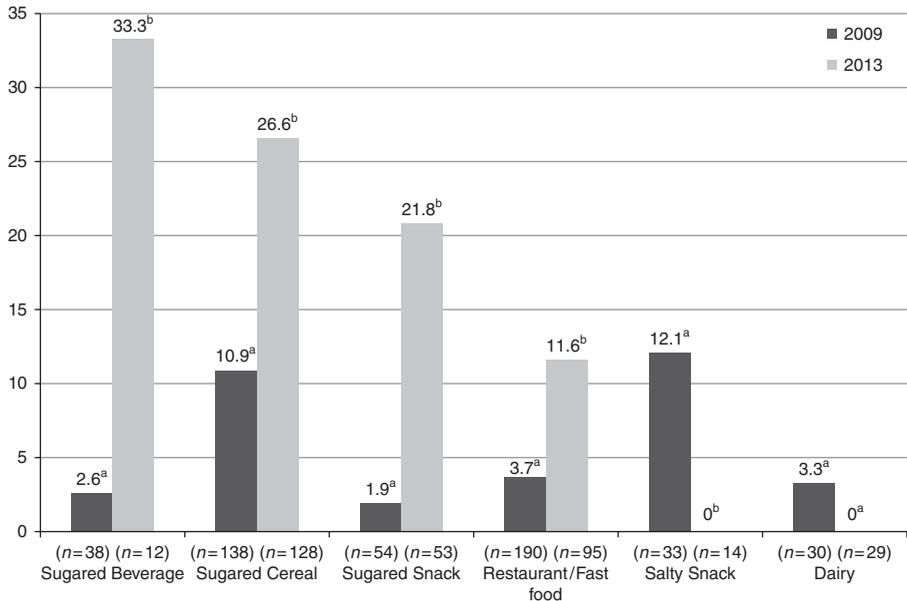
**Note:** Different superscripts indicate a significant difference within the nutritional category,  $p < 0.05$

**Figure 1.** Changes in the percentage of ads depicting physical activity by nutritional quality

*Product type.* Product categories represented by fewer than ten advertisements in either 2009 or 2013 were excluded from analyses. The remaining product categories, including sugared beverages, sugared cereal, restaurants/fast food, sugared snacks, dairy products, and salty snacks, represent 90.4 percent of all food advertisements in 2009 and 93.5 percent of all food ads in 2013. The data indicate that physical activity was depicted across all six product types in 2009, but was absent from promotions for salty snacks and dairy products in 2013. Nevertheless, there were significant increases in the use of this marketing technique among certain product types, particularly those that are high in added sugar (see Figure 2).

In 2009, just 2.6 percent of the 38 sampled advertisements for sugared drinks depicted physical activity. This increased to one-third of the dozen advertisements for this product type in 2013 ( $z = 3.09, p < 0.01$ ). Similarly, physical activity appeared in 10.9 percent of the 138 advertisements for sugared cereals sampled in 2009, but it was depicted in over one-quarter (26.6 percent) of the 128 ads for this product type sampled in 2013 ( $z = 3.30, p < 0.001$ ). The proportion of ads for sugared snacks that depict physical activity had also significantly increased by 2013. In 2009, 1.9 percent of the 54 sampled ads of this type portrayed physical activity. This increased to 20.8 percent of the 53 ads for this product type in 2013 ( $z = 3.10, p < 0.01$ ). In addition to high-sugar products, physical activity was depicted in significantly more advertisements for restaurants/fast foods, increasing from 3.7 percent of 190 ads in 2009 to 11.6 percent of the 95 ads in 2013 ( $z = 3.10, p < 0.01$ ).

*Nutritional quality.* Physical activity appears frequently in promotions for foods of various product types, yet this does not necessarily indicate each item's nutritional value. The "Go-Slow-Whoa" food rating system devised by the USDHHS (2005) was employed to evaluate the nutritional quality of advertised foods. That is, foods were



**Figure 2.**  
Percentage of ads depicting physical activity by product type each year

**Note:** Different superscripts indicate a significant difference between years for that product type,  $p < 0.05$

determined to be “Go” foods if they are healthy enough to consume any time, “Slow” foods if they are foods that should be consumed in moderation, and “Whoa” foods if they are items that should be restricted only to special occasions.

Figure 1 shows the division of ads for foods in each nutritional category that depict physical activity. No ads for “Go” foods in either 2009 or 2013 depicted physical activity. However, the frequency this health-related message was used in advertisements for “Slow” foods more than doubled from 7.0 percent of the 142 ads for Slow foods in 2009 to 15.2 percent of the 65 ads for Slow foods in 2013 ( $z = 4.01$ ,  $p < 0.001$ ). Most notably, results show that physical activity commonly appears in promotions for “Whoa” foods. Just 6.5 percent of the 385 ads for Whoa foods appearing in the sample from 2009 depicted physical activity, whereas such depictions appeared in 21.5 percent of the 285 ads for Whoa foods sampled in 2013 ( $z = 6.58$ ,  $p < 0.001$ ).

Viewed from a different perspective, 28.6 percent of the 35 ads depicting physical activity in 2009 promoted “Slow” foods and 71.4 percent promoted the least healthy “Whoa” foods. By 2013, 14.7 percent of the 71 ads depicting physical activity promoted “Slow” foods while the overwhelming majority, 85.9 percent, promoted “Whoa” foods. The nutritional quality of foods associated with physical activity in child-targeted advertising appears to have declined.

#### *Discussion of Study 1*

The findings of Study 1 suggest that marketing campaigns are appealing to consumers’ interest in health by frequently associating their products with physical activity. Physical activity was depicted in one out of every five child-targeted food advertisements in 2013. This is more than triple the frequency such portrayals

appeared in 2009. The increase is largely due to the promotion of physical activity in ads for high-sugar foods. These are typically the products nutritionists suggest be consumed only on special occasions.

The goal of Study 1 was twofold: first, to determine the prevalence of this marketing practice in 2013 as compared to 2009; and second, to determine the potential that this marketing strategy is associated with the minor improvements in childhood obesity rates identified by the CDC (2013). While this has clearly become a popular marketing strategy, it is unlikely to be helping decrease rates of childhood obesity. Physical activity is typically promoted in advertisements for highly obesogenic foods. Thus, this practice may be contributing to rather than deterring childhood obesity.

Scholars and critics have expressed concern that when foods high in salt, sugar, fat, and calories are presented as healthy dietary choices, this may encourage selection of an unhealthy product (Castonguay *et al.*, 2013; Mikkelsen *et al.*, 2007). However, if viewers recognize the juxtaposition of messages, then this practice could be off-putting. Of course, the findings from content studies alone cannot predict effects. Research is needed to directly examine children's recognition of juxtaposed beliefs regarding a food's healthfulness when presented within an advertisement that depicts physical activity in association with a high-sugar item, and the influence this has on product selections. This is the focus of Study 2.

## Study 2

### *Method*

*Design.* This study examines the responses of children exposed to a televised food advertisement promoting a high-sugar product alongside depictions of physical activity. Age differences were assessed by comparing responses of younger and older children. Younger children, defined as ages five to six, represent the minimum age that children are clearly recognizing which foods are healthful (Backett and Alexander, 1991). Older children, defined as ages ten to 11, represent the maximum age before adolescence when consumer choices are influenced by peer approval more than other factors (Valkenburg and Cantor, 2001).

The sample consisted of 34 younger children and 34 older children who individually viewed a five minute cartoon with an embedded commercial break. During the commercial break, each child saw a promotion for the Cartoon Network, a computer game, and a high-sugar food. For purposes of this study, a high-sugar food is defined as any item containing 25 percent or more of the recommended daily value of added sugar (i.e. ten or more grams). The cereal Frosted Flakes, which contains approximately 13 grams of sugar per cup, was selected as the stimulus product. Variables of interest include the child's age, recognition of juxtaposed beliefs regarding the cereal's healthfulness, and ultimate product selection when provided with snack offerings.

*Participants.* Following approval from the Institutional Review Board of the University of Arizona, parents of children aged five to six and ten to 11 were offered the opportunity to participate in this research. A convenience sample of 68 children (55.9 percent male, 62.9 percent white) was examined. Children were largely recruited from private schools and YMCA programs in Southern Arizona, where the average household income is \$36,939 and nearly one-quarter (24.2 percent) of adults have a college degree (United States Department of Commerce, 2013). Equal numbers of children in each age group participated. Specifically, 34 children born between

July 1, 2006 and December 31, 2008 and an additional 34 born between July 1, 2001 and December 31, 2003 took part in this study.

*Stimulus for the study.* The stimulus for this study depicts a promotion for the high-sugar cereal, Frosted Flakes. Frosted Flakes is one of the top five cereals marketed to children via media and the number one cereal marketed to children in stores. It is the only brand to associate its cereal with physical activity across all of its marketing (Yale Rudd Center for Food Policy and Obesity, 2013), yet even in name indicates that it is high in sugar. The selected advertisement portrays characters engaged in competitive sports, which children recognize as healthy at a young age (O'Dea, 2003). The advertisement frames the product as being healthful but does not make any explicit health claims. Thus, this advertisement made an ideal stimulus for instigating children's consideration of both healthy and unhealthy aspects of the product.

The methodology employed in this study is an adaptation of the projective techniques often used in consumer research (Donoghue, 2000). Exposing audiences to a particular stimulus in order to elicit thought is a common technique used in focus group research (Folk-Lyon and Trost, 1981). Webb (1992) describes this technique as a structured-indirect way of investigating the whys of situations. Techniques such as presenting a stimuli and asking participants' to name the first word that comes to mind, construct a story, or otherwise express their interpretation of the stimulus have been found valid and reliable in similar research and useful in explaining consumer behaviors (Donoghue, 2000). Thus, this study applies an adaptation of this technique by presenting an audience with an advertisement, assessing interpretations, and using this information to help explain product selections.

*Procedure.* Each child viewed a five minute segment of Looney Tunes with an embedded commercial break promoting Frosted Flakes, as well as a computer game and a promotion for the Cartoon Network. Following exposure to the cartoon and embedded advertising, each child was offered a snack to take home. Subsequently, a structured interview was conducted and recorded to determine whether the child recognized juxtaposed beliefs regarding the cereal's healthfulness. A script was followed as to not bias children's responses. The entire procedure took children approximately 15 minutes following viewing of the five minute media segment.

*Measures.* To avoid biasing behaviors, the child's snack choice was measured first. Immediately following viewing of the media segment, children were provided with three options of a snack they may take home with them. Options included the advertised food (Frosted Flakes), a similar product (Lucky Charms), and a comparable item overtly associated with health in its marketing (Special K). The items were of approximately equivalent size and placed in front of the child while the researcher gathered materials. Thus, the child selected in private. The selection was then noted but not discussed. The researcher placed the child's selected product in a bag of items to bring home. This way, the item was not a distraction for the child during the remainder of the study.

To assess recognition of juxtaposed beliefs, the open-ended interview structure used by Donaldson and Westerman (1986) to assess general responses to discrepant beliefs among children aged four to 11 was adapted. Children were asked to consider Frosted Flakes cereal and determine whether they thought the food was healthy or unhealthy. Then the child was asked why he or she made this judgment and to elaborate upon the aspects of the food that make it healthy and those that make it unhealthy. Finally, he or she was asked to confirm whether the item was healthy or unhealthy.

The researcher and a trained assistant met frequently to discuss the content of the interviews and develop a precise coding system. If the child stated competing beliefs regarding the food's healthfulness the child was said to have recognition. Competing beliefs were defined as related opposites. If the child mentioned an aspect of the food's contents that makes it healthy (e.g. wheat, vitamins, etc.), a related opposite point must also be an aspect of the food's contents that makes it unhealthy (e.g. sugar, fat, salt, etc.). Using this definition, believing the product is unhealthy due to content such as sugar but healthy because of societal reasons (e.g. Mom gives it to me) or the child's affection for the product (e.g. s/he likes it) did not qualify as recognizing competing beliefs. A subset of interviews ( $n=22$ ) was coded separately by the researcher and research assistant to establish inter-coder reliability (Krippendorff's  $\alpha = 0.99$ ).

### Results

It was expected that older children would recognize both healthy and unhealthy traits of an advertised cereal. Indeed, among the older age group 79.4 percent indicated that they recognized juxtaposed beliefs pertaining to the advertised cereal's healthfulness. Significantly fewer younger children had this recognition, with just 20.6 percent recognizing juxtaposed beliefs ( $\chi^2 = 23.53$ ,  $df = 1$ ,  $p < 0.001$ ,  $\Phi = 0.59$ ).

The influence this recognition had on product selections was then explored. Among children participating in this study, 27.9 percent selected Frosted Flakes. The remaining children selected a non-advertised product, either Lucky Charms (58.8 percent) or Special K (13.3 percent). However, of those younger children who did recognize juxtaposed beliefs, 71.4 percent selected the advertised product. This was significantly more than the 22.2 percent of children this age who selected the advertised product but did not recognize juxtaposed beliefs ( $\chi^2 = 6.15$ ,  $df = 1$ ,  $p < 0.05$ ,  $\Phi = 0.43$ ). Among older children, approximately one-fourth (25.9 percent) of those who recognized juxtaposed beliefs selected the advertised product. This was not significantly different from the 14.3 percent of older children who selected the advertised product but did not recognize juxtaposed beliefs ( $\chi^2 = 0.42$ ,  $df = 1$ ,  $p = 0.52$ ,  $\Phi = 0.11$ ) (see Figure 3).

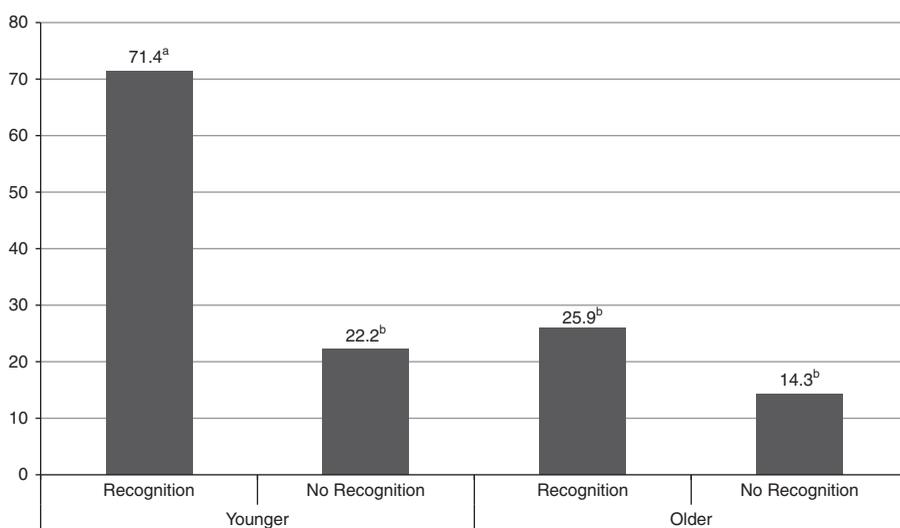
### Discussion of Study 2

Study 2 revealed that marketing messages pairing physical activity with a high-sugar cereal may influence older and younger children differently. As expected, significantly more older children recognized an aspect of the promoted cereal that is healthy as well as one that is unhealthy. This recognition was related to younger children's greater likelihood of selecting the advertised product. Given the high-sugar content of the promoted cereal, the results of Study 2 indicate that exposure to this marketing message has the potential to increase, rather than deter, rates of obesity among younger age children.

### Overall discussion

In recent years, consumers have shown an increased interest in physical well-being (IOM, 2010). Food and beverage companies have also pledged to promote a healthy lifestyle in child-targeted marketing (Peeler *et al.*, 2009). Indeed, the inclusion of physical activity in food advertising is often praised for encouraging children to get fit (Kolish and Peeler, 2008). While the results of this research indicate that this

**Figure 3.**  
Percentage of children who selected the advertised product by recognition of juxtaposed beliefs and age



**Note:** Different superscripts indicate a significant difference between groups,  $p < 0.05$

marketing tactic is on the rise, the way this strategy is currently being employed may actually result in poor dietary behaviors. Thus, its positive impact on children's health is questionable.

The goal of Study 1 was to assess the prevalence of the marketing strategy and determine whether shifts in this practice correspond with improvements in the rate of childhood obesity (CDC, 2013). Results revealed that, as of 2013, physical activity appeared in child-targeted food advertisements three times more frequently than it did in 2009. This message was frequently associated with foods high in added sugar. Therefore, it is not surprising that physical activity was most frequently depicted in ads for foods the USDHHS categorize as "Whoa" foods, that should be consumed only on occasion. Though in 2009 physical activity only appeared in 6.5 percent of ads for "Whoa" foods, by 2013 physical activity was depicted in over 21 percent of ads for the least healthy products. Conversely, no advertisements for products the USDHHS has categorized as "Go" foods, those that should be consumed most frequently, depicted physical activity in either 2009 or 2013. The findings of Study 1 raise concern that it is only the advertising techniques and not the product portfolios that are changing, limiting the potential of this practice to help combat the negative influence food advertisements can have on children's health.

The goal of Study 2 was then to extend this investigation to assess how different age children understand this marketing tactic and the influence that understanding has on product selections. Thus, Study 2 further assessed how this marketing strategy may be contributing to, rather than deterring, childhood obesity. Results suggest that this marketing strategy may encourage the consumption of unhealthy foods, at least among younger age children who have the ability to recognize juxtaposed beliefs regarding an item's healthfulness.

Research with young children (Lapierre *et al.*, 2011) and adults (Cheong and Kim, 2011) suggests that health-related messages can actually encourage the consumption of unhealthy foods. However, Dorey and McCool (2009) found that ten to 12-year old

children were bothered by the incongruity inherent in advertising promoting fast food alongside sports celebrities. Research regarding developmental differences in children's abilities to process competing beliefs helps to reconcile these disparate findings.

While adults appear to find the pairing of an unhealthy food and health-related message mildly discrepant, and therefore like the product more (Cheong and Kim, 2011), older children find this type of pairing off-putting (Dorey and McCool, 2009), and younger children are unlikely to recognize or be bothered by juxtaposed beliefs (Donaldson and Westerman, 1986). Indeed, Study 2 found that older children were more likely than younger children to recognize juxtaposed beliefs regarding a product's healthfulness following exposure to an advertisement pairing a high-sugar food with physical activities. The influence of this recognition on the product selections of each age group was then explored.

In younger children, who have been shown to easily alter cognitions to maintain consistency, recognition of juxtaposed beliefs regarding the product resulted in significantly greater selections of the promoted item. Older children, who have been shown to have greater difficulty resolving cognitive inconsistencies, were not significantly more likely to select the advertised product when they recognized juxtaposed beliefs. Thus, this study helps to explain disparate findings in research that did not focus on age differences, yet sampled a younger (Lapierre *et al.*, 2011; Levin and Levin, 2010) or older (Dixon *et al.*, 2007, 2013) population of children, resulting in differing findings regarding the influence of health-related messages in food marketing.

The data are consistent with the SP+T framework. This suggests that older children may find the juxtaposition of physical activity and a high-sugar product extreme and thus perceive the product negatively. Conversely, younger children may not find the juxtaposition extremely discrepant, explaining why they preferred the product when they recognized competing beliefs.

Additionally, the findings support the notion of cognitive consistency (Abelson *et al.*, 1968; Festinger, 1957; Heider, 1958), which suggests that individuals like balance among cognitions. Further, when information is provided regarding a cognition, then related, yet unspecified, cognitions are impacted (McGuire, 1960). Thus, if a child believes that healthy foods are desirable and that physical activity is a healthy activity, then a food that appears to enhance physical activity should also be more desirable, despite that the child was never explicitly told the food is healthy. Recognition that the food believed to enhance physical activity is also high in sugar (which is known to be unhealthy) could lead to cognitive inconsistency. To alleviate this, cognitions are often justified or altered. Future research is needed to further investigate whether children ultimately weaken their belief that sugar is unhealthy and/or their desire to be healthy to maintain cognitive consistency while choosing a desired product recognized as having healthy and unhealthy traits.

### Limitations

Both Study 1 and Study 2 have limitations. For example, in Study 1 depictions of physical activity were defined as sustained physical exertion. However, symbols of fitness, such as characters wearing a sports uniform or carrying sports equipment were not included. Research should therefore assess changes to depictions of physical activity defined more broadly.

Furthermore, the "Go-Slow-Whoa" system of categorizing foods is highly simplistic, overlooking many dietary complexities. Future content analyses could therefore investigate the specific healthful and unhealthful components of a food product rather

than placing each item solely in broad categories. Nevertheless, this system of categorizing foods is promoted by the US Government (USDHHS, 2005), which underscores its legitimacy.

Furthermore, Study 2 did not directly test the SP+T model or the notion of cognitive consistency. Future research is needed to confirm these theoretical mechanisms. Research should also examine this phenomenon with advertising for other foods to determine whether these findings generalize beyond breakfast cereal. Additionally, further comparison to advertising that does not include a health-related message would be useful in assessing the specific impact of this marketing practice.

Likewise, moderating variables such as parental education and income or a child's familiarity with the stimulus product should be investigated. Though this study attempted to collect demographic data from parents, an exceptionally low-response rate prevented the inclusion of these variables in analyses. Still, demographic data pertaining to the region is presented.

### *Conclusion*

Childhood obesity is a serious health concern (WHO, 2013) and advertising exposure is known to be a contributing factor (IOM, 2006). However, in recent years consumers have expressed an increased interest in product's appearing healthy (IOM, 2010) and food companies have committed to changing their child-targeted marketing practices to promote a healthy lifestyle (Kolish and Peeler, 2008). Simultaneously, there were some improvements in childhood obesity rates (CDC, 2013). Therefore, this study sought to expand upon the literature in this field by investigating one particular manner by which companies can promote health, depicting physical activity, and explore how this marketing strategy corresponds with aspects of children's beliefs and behavior that relate to obesity.

We found that between 2009 and 2013 the frequency of ads depicting physical activity more than tripled. On the surface, it appears that advertisers have been making an extra effort to promote children's health. However, concern is raised by the findings of this research. The data make clear that depictions of physical activity are increasingly common in advertising for foods too high in sugar to be healthfully consumed on a regular basis, yet they remain entirely absent from ads promoting genuinely nutritious products. Therefore, this marketing tactic is unlikely to have a positive impact on children's diets.

This research also suggests that efforts to promote health in advertising may even contribute to poor dietary choices. Study 2 exposed children to advertising promoting Frosted Flakes cereal alongside images of characters engaged in physical activities. Following exposure, those younger children who could identify both healthy and unhealthy traits of the cereal were more likely to select the advertised product when offered three options. This was not the case for older children.

As Dorey and McCool (2009) revealed, older children find the pairing of an unhealthy food and athletics off-putting. Though there was not a significant decrease in selection of the advertised product when older children had this recognition, there nevertheless was not the increase revealed among younger children and in prior research with adults (Cheong and Kim, 2011). This too is consistent with developmental research indicating that children aged eight to 11 often struggle when confronted with juxtaposed beliefs (Donaldson and Westerman, 1986).

Many foods can be healthy in some regards (e.g. provide energy and vitamins) and unhealthy in others (e.g. high in sugar, fat, or sodium). Educational efforts often encourage knowledge of these traits (Sharma, 2011). However, the findings of this study bring that practice into question.

Simply teaching young children to identify what makes an item healthy and unhealthy may actually increase the appeal of foods that are high in sugar yet promoted alongside depictions of physical activity. To combat this, the influence of media should be addressed in nutrition education programs more directly. Media literacy skills are often taught to help older children resist being persuaded to consume a food they know to be unhealthy yet find appealing (Yates, 1999). Educators must be aware that media now use “health” as a marketing tool in addition to other efforts to persuade children.

In addition to nutrition education, government intervention may help to prevent the adverse effects of food advertising on children. The Federal Trade Commission has some, albeit limited, authority to restrict advertising. However, it is the Food and Drug Administration that regulates health claims used to promote foods. In 1990, the Nutrition Labeling and Education Act was passed, allowing companies to promote foods with health claims, such as “nutritious,” “high in vitamin C,” or “may help reduce the risk of heart disease.” These claims are only permitted if products meet stated requirements. Specifically, there must be sufficient scientific literature to support the claim, it must be stated so that the audience can comprehend the information provided, and it should allow the audience to understand how the food contributes to a total daily diet (Institute of Medicine (IOM), 2012).

Though the goal of this research is in no way to advocate for or against regulation, it does raise an important question for legal scholars interested in food marketing to children. Specifically, what constitutes a “claim”? Health claims typically consist of explicit statements or symbols, such as the Smart Choices checkmark, that have been designated to represent specific information regarding the product’s nutrient content (IOM, 2012). It is up to policy makers to determine whether implicit messages, such as the depiction of physical activity, in marketing constitute such claims.

The results of this study indicate that marketers are increasingly associating high-sugar foods with physical activity, older children are more capable of recognizing juxtaposed beliefs regarding a product’s healthfulness than are younger children, and that recognition of juxtaposed beliefs regarding an advertised food can actually increase its appeal, at least among five to six-year old children. Fortunately, small improvements in the obesity rates among young children have occurred. Unfortunately, advertisers’ increased use of depictions of physical activity when selling food to children is unlikely to be a contributing cause. Instead, this advertising tactic has the potential to contribute to, rather than to deter, childhood obesity.

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#### **About the author**

Dr Jessica Castonguay is an Assistant Professor of Advertising at Temple University. Her research focusses on advertising to children. Dr Jessica Castonguay can be contacted at: [tug11607@temple.edu](mailto:tug11607@temple.edu)

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