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Influence of Spokes-characters on Children's Perceived Healthiness of Breakfast Cereals

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Thesis Abstract

Title: **Influence of spokes-characters on children's perceived healthiness of breakfast cereals.**

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Introduction: According to the World Health Organization (WHO), an unhealthy diet is one of several preventable risk factors for non-communicable diseases such as Type 2 diabetes and obesity. There is growing concern as these nutrition-related conditions are developing in children and youth. Evidence from the literature has demonstrated that food marketing has been directly associated with the diets of children. While it is known that food companies use spokes-characters to build emotional ties between children and the food product being advertised, less is known on spokes-characters' influence on children's perceptions of healthy and unhealthy food products.

Objectives: 1) To determine if children will rate breakfast cereals as healthy or unhealthy based on the presence of spokes-characters on the front package, 2) To determine if children will rate breakfast cereals as healthy or unhealthy based on the presence of "other" (non-spokes-character) images and/or text they see on the front package.

Methods: Participants (n=34) aged seven to eight years old from the Girl Guides of Canada Brownie units participated in this study. Participants rated eight different cereals using a Visual Analogue Scale (VAS) questionnaire following a dietetic-intern led information session (on how to complete the VAS). They were asked the following questions: 1) How healthy is the breakfast cereal? 2) What do you see on the front package that makes you think the cereal is healthy or unhealthy?

Results: Mean VAS (\pm SD) scores for each breakfast cereal were grouped under three categories: 1) Unhealthy (0 to 40), 2) Neither unhealthy nor healthy (41 to 70), and 3) Healthy (71 to 100). Breakfast cereal mean VAS (\pm SD) scores were: Lucky Charms 21.0 \pm 18.6, Star Wars: 22.3 \pm 13.5, Corn Pops 44.4 \pm 20.8, Frosted Flakes 45.0 \pm 27.3, Golden Graham Crunch 50.2 \pm 21.9, Frozen Frosted Cheerios 54.5 \pm 21.8, Cheerios 68.5 \pm 22.6, and Spoon Size Shredded Wheat 72.9 \pm 19.4. Qualitative data analysis showed that only one participant thought spokes-characters impacted their perceived healthiness of a breakfast cereal. It is possible that other (non-spokes-character related) images and text on the front package may have impacted children's perceived healthiness of breakfast cereals more than that of spokes-characters.

Conclusions and Implications: Future research on spokes-character advertising on the front package should consider using a pilot project with children to conduct face validity on the questionnaire. Additionally, the use of focus groups in addition to a quantitative approach could be an alternative method. Asking children directly if they think spokes-characters on the front

package are associated with a healthy or unhealthy product would provide a clearer answer. This project has supported the development of a number of hypotheses that may be explored in future studies.

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Glossary

Advertising: Promotional component of marketing used to promote the product to the attention of consumers (1–3)

Brand Mascots: Characters that have an advertising origin, and developed solely for advertising a specific product; these include *Tony the Tiger*TM and *Chester the Cheetah*® (4)

Cartoon Media Characters: Individuals with a non-advertising origin. They are recognized mainly for their popularity from films and movies as well as television. These include *Dora the Explorer*TM and *Spongebob SquarePants*TM (4).

Children: A person who is 12 years old and younger (5).

Child-audience Share (Viewership): The percentage of the audience comprised of children 12 years and under (6).

Marketing: An activity and a set of processes that includes developing, promoting, and selling services or products to customers that benefit an organization and its stakeholders (1). It involves defining the target population, conducting research, and analyzing the competition (7).

Ready-to-eat (RTE) Breakfast Cereals: Belong to a group of foods that are shelf stable, require no preparation time, and are intended to be eaten directly from the package (8).

Screen Time: involves time spent in front of all digital screens including television, computers, smart-phones, etc (5).

Spokes-characters: Spokes-characters represent an extensive array of fictional or anthropomorphic beings and/or objects (4,9,10), which can be sub-categorized under cartoon media characters and brand mascots (See above).

Introduction

According to the World Health Organization (WHO), an unhealthy diet is one of several preventable risk factors for non-communicable diseases such as Type 2 diabetes and obesity (11). There is growing concern as these nutrition-related conditions are developing in children and youth, where poor eating behaviours formed in childhood can progress into adulthood, impacting long-term health and chronic disease risk (12,13). In 2015, it was estimated that a diet low in fruit and vegetable and high in processed foods contributed to 37% of deaths worldwide (14). A review of the literature has demonstrated that food marketing has been directly associated with children's diets, where foods being advertised are often highly processed (1,15–19). Popular marketing techniques used by food companies include the use of spokes-characters to facilitate product associations (4,20). Product associations are defined as food and drink products accompanied by specific brand names (4,20,21). Spokes-characters personalize marketing by using children's perceived relationship with the character to draw attention to their product. Food companies use either brand mascots or cartoon media characters from television to build emotional ties with children, in order to foster brand loyalty for their food products typically advertised through television, the Internet, and on the front of food packages (4).

Children's food choices and preferences may be influenced by spokes-character marketing from television, and subsequently on the front of food packages. Evidence has shown that children are able to imitate the actions and behaviours of not only real life models, but also models from television and film (22,23). While data currently exists on spokes-character marketing and children's behavioural outcomes (i.e. taste preferences, spokes-character recognition, etc.), less is known on children's perceived healthiness of foods in the presence of spokes-characters.

This thesis explores spokes-character marketing on children's perceived healthiness of eight different breakfast cereals. Thirty-four children aged seven to eight years old have been recruited from the Girl Guides of Canada Brownies units in the Harbourside and Tri-Waters Area. Children were asked to rate each breakfast cereal along a Visual Analogue Scale (VAS) line and to describe whether anything they saw on the front package affected their perception of healthy or unhealthy. Our research objectives include the following:

- 1) To determine if children will rate breakfast cereals as unhealthy, neither unhealthy nor healthy, or healthy, based on the presence of spokes-characters on the front package

2) To determine if children will rate breakfast cereals as unhealthy, neither unhealthy nor healthy, or healthy, based on the presence of “other” (non-spokes-characters) images and/or text they see on the front of the package

Chapter 1.0: Literature Review

1.1.0 Food Marketing Channels

Common channels of food marketing include television, Internet, and the front of package food products listed below. Unlike traditional modes of advertising through television, evidence points out that children are not always aware of and able to identify advertisements circulated using newer marketing techniques (24). These include advertisements rooted in media content such as video games from the Internet and front of package labels (24).

1.1.1 Television Food Marketing

Television is one of the most popular food marketing channels (20,25–27). In Canada, most children exceed screen time recommendations (no more than two hours per day) (28). For children under the age of two years, no screen time is recommended (28). Screen time involves time spent in front of all digital screens including television, computers, smart-phones, etc. (5). According to *Statistics Canada*, children three to four years of age spend an average of six hours each day on screen time, children five to 11 years of age spend an average of eight hours each day on screen time, and children 12-17 years of age spend an average of nine hours each day on screen time (5). Canadian research has demonstrated that during children's television programs, 15% of advertisements in Quebec (29), 18% in Ontario, and 19% in Alberta (30), are derived from food and/or beverage-related promotions. With the exception of the province of Quebec, advertising to children in Canada is largely self-regulated by the Canadian food industry who works closely with the government as well as non-government organizations (31).

1.1.2 Internet Food Marketing

Although television remains the most popular venue for food marketing, online marketing is also on the rise (32–34). About 30% of Canadian children in grades 6 to 12 (11 to 18 years of age) on average spend greater than two hours each day on the computer (32). Internet-based marketing is appealing to food companies as it is relatively inexpensive when compared to television (35). Internet-based advertising provides the added advantage of garnering greater brand loyalty through multiple forms of entertainment. For instance, when children surf the Internet, they may engage in games, puzzles, quizzes, contests, and music, all of which are in the presence of advertised licensed merchandise that can be bought online to promote brand loyalty (19). The Internet also allows marketers to accumulate information about

target audiences, which they are unable to do through television advertising. Food companies can follow and track children's online activities and behaviours in order to gain a better understanding of the effectiveness of their advertisements aimed at children (36). For example, information and data regarding children's online behaviour is often collected and tracked through the use of cookies (37). Children's user information can also be collected through registration procedures that require personal email addresses and other private information where such data can be used for subsequent marketing efforts (38). One Canadian survey reported that greater than 70% of children who played online games perceived them as just games, and not advertisements (39). This is an example of stealth marketing. Stealth marketing is a marketing strategy where the intent of an advertisement is concealed in a way that consumers are not able to recognize it (40). In this way, marketers are using passive marketing techniques to advertise to children in games. After playing a certain game several times and with continuous repetition, children may be exposed enough to an advertisement that they become familiar with the advertised product without realizing it (41).

1.1.3 Front-of-Package Marketing

Due to an increase in the number of products and brands in the marketplace, food packaging is being used as a marketing tool to build brand awareness and to establish product differentiation (42). Food and drink packaging plays a significant role in the decision-making and purchasing process, as it is often the first thing a consumer sees on the shelf (42). Graphics on food and drink packaging have the ability to influence consumer behaviour. Pictures allow consumers to interpret information easier and quicker than do text-based information (43–46). They also have greater influence on the decision-making process in situations where consumers spend very little time analyzing the product (43–46). Spokes-characters (defined in greater detail at a later section) function to advertise food products by providing meaning to the brand and utilizing emotion to build a relationship between the brand and the audience it advertises to (16). Though television marketing and print media marketing are derived from different media channels, one can potentially impact the other. Children who rely on spokes-characters on the front package to justify their food product choices, often do so because they have formed a brand preference for the spokes-characters they have seen through television marketing in the past (47). For example, some children responded by stating that their choice for their favourite product was because "It has the characters that I see on the television" (47). This supports that children have a

preference for spokes-characters they see and like on television, and will choose a food or drink product based on the presence of their favourite character on the front package.

Food labelling has also been classified as a marketing technique (48). Food labelling serves three primary purpose: 1) Providing basic product information including common name, ingredient list, shelf life, 2) Providing health, safety, and nutrition information such as food allergy information, instructions for safe storage, and quantity of macro- and micronutrients, 3) Act as a platform for food marketing, promotion, and advertising via label claims such as low fat, cholesterol-free, high source of fibre, organic, and no preservatives added (49). While food labelling allows consumers to differentiate and choose healthier food options, it has also been classified as a food marketing technique as it includes elements beyond the minimum requirements for a packaged item (48). These additional elements often appear in the form of nutrient content claims or health claims, also known as voluntary claims (48). These voluntary claims are subject to the general principles for labelling and advertising under the *Canadian Food Inspection Agency* as regulated by the Government of Canada. Nutrient content claims are statements that describe the quantity of a nutrient or energy in a food or group of foods (49). Health claims refer to any aspect in food labelling or advertising that suggests, implies, or states that an association exists between the consumption of a food product and health (49). Some health claims may be subject to further specific requirements such as a premarket approval prior to obtaining clearance for use on the front package (49). While these two forms of nutrition labelling are typically regarded as an influential marketing technique directed at adult consumers, emerging evidence has suggested that they are also commonly found in children's advertisements, and that children tend to be quite receptive and persuaded by these promotions (50). Children face many challenges when asked to interpret information from the nutrition facts table to determine the healthiness of a product. They are becoming increasingly trusting and reliant on front-of-package health claims to evaluate healthy products, even if they have minimal understanding of this information (51).

1.2.0 Spokes-Characters

Spokes-character advertising can be sub-categorized into brand mascots and cartoon media characters. Brand mascots (also known as advertising ambassadors, trade characters, and non-celebrity spokes-characters) and cartoon media characters (otherwise known as celebrity spokes-characters) represent an extensive array of fictional or human animated objects or

anthropomorphic beings (4,9,10,16). These spokes-characters are classified as having an advertising or non-advertising origin. Characters that have a non-advertising origin can be categorized as celebrities because their popularity is succeeded through films and movies as well as television and comic strips (52). They have well-defined personalities that can be later associated with a particular product (52). Examples of celebrity spokes-characters include *Dora the Explorer*TM and Spongebob from *Spongebob SquarePants*TM. These television characters are well-known and portray similar characteristics as human celebrities in that they have the ability to attract attention and create positive associations through product endorsements (52). Non-celebrity spokes-characters are those with an advertising origin as they were initially developed for the sole purpose of advertising (52). It is possible that non-celebrity spokes-characters are more effective than celebrity spokes-characters because the product identity that they represent is solely for that product (53). Examples of non-celebrity spokes-characters include *Toucan Sam*TM, *Tony the Tiger*TM, and *Chester the Cheetah*[®]. While celebrity spokes-characters such as cartoon media characters are originally developed for animation in films and entertainment, they have been licensed through agreements owned by entertainment companies to be used in promotional aspects of food marketing (16). Non-celebrity spokes-characters such as brand mascots on the other hand, are commonly used by restaurants and food companies to create brand personality and product identity (4). Companies that utilize a brand mascot for brand promotion have legal rights to 100% of the proceeds generated in the retail industry (16).

1.2.1 Spokes-characters' Functions in Food Industry

Spokes-characters have two distinct and essential functions in the marketing industry. The first function of a spokes-characters' personality is to provide meaning to the brand it symbolizes. This process is completed by allowing the spokes-character to transfer its own cultural meaning to the product (4). Advertising generally functions to appoint meaning to a product by connecting the product to social norms and the attitudes embedded within it (54). These associations illustrate the link between the characteristic traits and personality of the spokes-character and the product itself. Through this process, spokes-characters act almost like triggers that prompt consumers to recall the context and attributes associated with that character. For example, when a box of breakfast cereal was shown to children, one with no spokes-characters on the front package, and another with the spokes-characters Mumble and Gloria from *Happy Feet*TM, children reported liking the cereal more when the spokes-characters were present

on the package (55). It is likely that children who were familiar with *Happy Feet*TM were able to bring the food product into the context of the film, and providing it with meaning. It is possible that through this process, children's ambiguity of the food product they were asked to taste was decreased, thus, rating it as tasting better than the cereal box without a spokes-character. As a second example, *Chester the Cheetah*® has also been used as a spokes-character and brand mascot for Cheetos puffs. He is able to represent the Cheetos puffs in a unique way because "Cheetos puffs are orange and go fast; *Chester the Cheetah*® is also orange and goes fast" (56). In a similar illustration for breakfast cereals, *Toucan Sam*TM is colourful and fun; Fruit Loops cereal is also colourful and fun (56). All spokes-characters utilize their personalities in some way as a representation of the brand they originate from by passing their personalities on to the product they are advertising.

The second function of spokes-characters is to provide emotional appeal for the brand. A spokes-character can achieve this through its representation of emotional benefits, which be passed on to the product (4). The spokes-character accomplishes this by imparting the affection, sincerity, and warmth representative of an actual personality, to the product (57). This generates an emotional bond between the spokes-character and the consumer (58), and is central to the persuasive potential of the character. The spokes-character humanizes the product (56) and lends it a sense of conscience and moral principles (59). Using the same example of the spokes-characters from *Happy Feet* mentioned above, children who enjoyed watching the movie and the main characters, most likely associated the fun and enjoyment they had with the film and transferred it to the food product. This creates an emotional tie between the audience or consumer and the brand, and perhaps even the manufacturer. The emotional bond created by the spokes-character makes the product reliable and trustworthy, and even markets the image it represents (57). Both of the above mentioned functions work together to produce a successful character, and ultimately a distinguished brand image.

1.2.2 Children's Relationship with Spokes-characters

Children learn about spokes-characters through various advertising mediums such as the Internet, television, films, and food packaging (60). These characters are often associated with memorable stories, slogans, musical themes, and taglines (61–64), and most often will market positive feelings associated with products through emotional appeals, humour, and parent-child interactions that generate the notion of fun (4,52,62,64). The mechanism by which spokes-

characters influence children's behaviours can be understood by what academia have described as parasocial interactions (65). The relationship between a spokes-character and the viewer is termed a parasocial interaction or relationship due to the existence of a non-reciprocal, one-sided relationship, where one party is very conscious and knowledgeable of the other party but not vice-versa (66). The literature points out that the relationship between the audience and spokes-character is dependent on several perceived and attractive characteristics exhibited by the spokes-character including: Social, physical, and moral attributes similar to the viewer (67).

Characters that are central to a plot, identify as protagonists, and communicate directly to audiences invoked a greater parasocial interaction from their viewers (67). While it has been noted that children lean towards selecting favourite characters that are the same gender as themselves, it appears girls tend to choose less gender-typed characters compared to boys (68). Characteristic traits of role models and characters, such as physical strength, are more likely to appeal to boys than to girls (69). Similarly, boys are more likely than girls to nominate sport celebrities as a role model (69). The well-being and socioeconomic status of children are also attributes which affect the degree to which a child will associate or identify with a character. Children who were lonely demonstrated a stronger parasocial relationship with spokes-characters compared with children who scored as less lonely (70). As well, when two qualitative outcomes were observed (aggression vs. leadership), it was noted that those who had conduct difficulties tended to identify more with aggressive characters and less likely to consider characters with leadership skills as role models (71)

Evidence from the literature points towards the importance of studying spokes-characters as they play a strong role in influencing children's food choice and preferences. Spokes-characters behave as role models that children and youth can identify with (72). According to Bandura's Social Cognitive Theory, role-modelling has the potential to influence children's behavior through imitation, both from real life models as well as cartoon filmed models on television (22,23). Thus, spokes-character marketing from television can be extrapolated to front of package marketing to children, where the same spokes-characters in digital film are packaged, tweaked, and advertised through a different media channel. Research studies that facilitated the development of the current theory include the early experiments conducted by Albert Bandura on young children. Scientists found that children exposed to an aggressive adult model aggressing towards a toy called a "Bobo Doll" exhibited far greater aggressive responses compared to the

non-aggressive adult model or control group (22). The findings provide important evidence in demonstrating how children are able to learn and act through observing how others behave.

In a similar replicated study conducted by Bandura 1963, experiments of aggression towards the Bobo Doll continued with slight changes, where human and cartoon films were incorporated into the experiment in addition to real-life models (23). Children were separated into four distinct groups: a real-life aggressive model, human film modeling aggression, a cartoon film modelling aggression, and a control group (23). Again, results of the experiment provided evidence to support filmed aggression and its influence on children's behaviours. Not only did filmed aggression encouraged the manifestation of aggression, it also successfully shaped the form of each participants' aggressive behavior (23). The discovery that children imitated the behaviour of the film characters to some degree proposes that mass media in the form of television, can potentially act as an important source for learning social acts (23).

1.3.0 Children's Understanding of Food Advertisements

There has been much debate on the level of understanding children have of food and beverage marketing and its effects on children's food choices and behavioural outcomes. Research with cognitive development in children in relation to food marketing, generally emphasized their ability to identify the differences between television programs and commercials, or their ability to comprehend the selling intent of the advertisements (73,74). Children's behaviour towards advertising can be partially explained through child developmental theories, which provides a valuable insight into how children of different age groups react differently to food advertising (75). Some studies have drawn upon Piaget's theory of cognitive development where three distinctive developmental phases have been proposed: Early childhood (five years and under), middle childhood (six to nine years), and late childhood (10 to 12 years)(76). The literature has provided mixed findings on the exact age that children are able to recognize and comprehend the underlying persuasiveness of advertisements, however most observations made seem to be based on the developmental phases of cognitive growth (73–75).

Empirical findings have demonstrated that by five years of age, about 75% of children are able to identify an advertisement (77–79). By eight years of age, majority of children are able to recognize an advertisement's selling intent to influence purchasing decisions (80,81). The American Psychology Association Task Force on Advertising and Children concur that children younger than eight years of age lack the cognitive abilities to sufficiently process and understand

the persuasive tactics underlying food advertising (82). But by seven or eight years of age, children are able to recognize the general intentions behind television advertising, however they are still unable to organize that information in their everyday lives (75). In late childhood (10-12 years of age), children gain a better sense of abstract thought and reasoning, therefore most researchers believe that children's ability to understand advertising tactics is generally developed by the age of 12 (83,84). In contrast, other findings have revealed that children as young as eight to 12 years of age are able to comprehend advertising tactics (85). A probable explanation for this is that as a result of the changing media environment that children are situated in, it is likely that early exposure has increased their advertising literacy at a younger age (85).

Older children are thought to have greater cognitive defenses against food advertising, but this may not be entirely true (85). Ross et al., proved that older children were no better than younger children at being able to accurately decipher commercial messages that relate to the presence of "real fruit" in a cereal commercial (86). Similarly, Andronikidis and Lambrianidou (87) found that only a minority of older children aged 10 to 11 years were able to correctly point out the persuasive intent of commercial advertising. Hence, the collective consensus from the literature seems to be that children's ability to process, evaluate, and guard against advertising is reflective of the development of executive functioning skills that evolve from adolescence into early adulthood. Even though older children have a better understanding of the intent of food advertisements, they are not exempt from their persuasive intents to influence purchasing and consumption behaviours (85).

1.4.0 Influence of Spokes-characters on Children's Cognitive and Behavioural Outcomes

Spokes-characters have demonstrated their influence over children's cognitive and behavioural outcomes in several ways. These included spokes-character preference, snack preferences, purchase requests, spokes-character recognition, recall, and preference (familiar characters vs. unfamiliar characters), increased appetite, and intent to consume (16), just to name a few. In a systematic review of the literature on spokes-characters and children's diet and health, various cognitive and behavioural outcomes were found to be associated with a popular spokes-character (both brand mascots and cartoon media characters). One known cognitive outcome was that children preferred a familiar and congruent character-product pair (ie. Grey rabbit and carrot) in association with a food product by a story, over an incongruent or mismatched character-product pair (ie. Grey rhino and carrot)(88). A second cognitive outcome

was that children showed a high level of recognition and recall for familiar spokes-characters (89,90) in addition to the content and product that was being advertised when the spokes-character was present, compared to no spokes-character (91,92).

In terms of behavioural outcomes, children's favoured spokes-characters such as those from Sesame Street, encouraged greater consumption of certain foods over their counter-parts (65,93). Children were more likely to prefer and select foods that were associated with spokes-characters they were familiar with and liked (65,90). This correlation was especially strong for sugary and salty snacks of low nutritional value (65). Popular and less popular spokes-characters also affected and increased children's purchase requests for foods such as fruit (94). However, neither familiar nor unfamiliar spokes-characters had the ability to reduce preference for and purchase request for fruit (94).

Spokes-character advertising and its effect on children's behavioural outcomes can be understood through the Theory of Planned Behaviour. The Theory of Planned Behaviour states that performance of a behaviour is linked to both behavioural intentions and perceived behavioural control (95). Behavioural intention is an indication of an individual's readiness to perform a specific behaviour or a subjective estimate of how ready we are to engage in a behaviour (95). This construct is based on three components: 1) Attitude, 2) Subjective norms, and 3) Perceived behavioural control (95). Spokes-character advertising that targets all three of these factors will have a greater impact on children's choice and preference for specific food products. Research from a systematic review has shown that children are familiar with spokes-characters and have a high recall for products associated with spokes-characters (attitude)(16). Children may perceive spokes-characters as a role model and friend (normative belief), and may consider spokes-characters as trustworthy and a source of encouragement (motivation)(95). Children's perceived behavioural control may be determined by the presence of familiar or unfamiliar spokes-characters. Research demonstrates that spokes-characters that children were familiar with had a greater influence on behavioural outcomes compared to unfamiliar spokes-characters (16,95). These three factors (attitude, subjective norms, and perceive behavioural control) work together to explain how spokes-character advertising influences children's behavioural outcomes (95).

Both the Social Cognitive Theory and the Theory of Planned Behaviour work together to explain how children's behaviours are formed. For instance, even though children see

advertisements with role models (spokes-characters) present on television or in films, this may not be enough to predict their behavioural imitation of these role models. On the other hand, if children have a positive attitude of spokes-characters where they are viewed as role models, and believe they have the perceived capacity to generate a behaviour change, then change may occur (95).

1.5.0 Canadian Marketing Regulations: Advertising Industry

Several countries have implemented food policy reforms to regulate food industry's compliance with federal laws. Norway subsidizes healthy foods in order to increase affordability while the United Kingdom has developed restrictions on unhealthy food advertising to children in addition to regulating the food industry's compliance for reducing the sodium content of foods (11). Other countries such as Denmark have also introduced limitations on trans fats and sodium (11). In Canada, food marketing regulations are based upon three main levels: 1) Food industry self-regulation, 2) Federal government, and 3) Provincial government.

1.5.1 Food Industry Self-Regulatory Initiatives: CAI and non-CAI Regulations in Canada and U.S.A.

In 2007, 16 food and beverage manufacturers including fast food restaurants (now 18), created the Canadian Children's Food and Beverage Advertising Initiative (CAI), a voluntary commitment to decrease the quantity of unhealthy food advertising directed at children under the age of 12 years (96). About half of these food companies promised to abstain from advertising to children under the age of 12 years, while the other half pledged to advertise healthier options through television, radio, print media, and the Internet (96). As well, these companies promised to limit their use of licensed spokes-characters for products that did not comply with CAI nutritional standards (96). These standards require that Canadian CAI participants meet the criteria for at least one of the following requirements: 1) Foods that reflect Canada's Food Guide dietary guidelines, 2) Foods that meet Canadian Food Inspection Agency (CFIA) Guide to Food Labelling and Advertising guidelines for nutrient content claims, 3) Foods that meet CFIA Guide to Food Labelling and Advertising guidelines for disease risk reduction claims, function and nutrient function claims (96). Through a more in-depth study conducted by Kent, Martin, and Kent, results indicated that the pledged Canadian CAI companies as promised, achieved an

overall reduction in food and beverage advertising on children's television channels by 24% (97). For instance, advertising of regular and diet soft drinks were entirely eliminated by CAI companies, and since 2006, juice advertising has dropped by 67% (97). Additionally, reduction in Canadian CAI companies' advertising for chocolate bars, candies and cookies were also seen on children's specialty channels (97). On the other hand, this success was to some degree offset by the increase in non-Canadian CAI companies advertising on children's television channels, as fast food advertising was the largest category representing 38% of non-CAI companies' advertisements (97).

When compared with non-CAI companies, Canadian CAI participating companies were no better at decreasing the number of unhealthy food advertising to children. Advertisement repetition, which is correlated with children's preferences and behaviours (98), as well as the use of spokes-characters have been found to be used significantly more in Canadian CAI advertisements than with non-Canadian CAI advertisements (99). These promotions with spokes-characters were more likely to promote less healthy foods than the non-Canadian CAI companies (99). Though it was expected that Canadian CAI food and beverage advertisements have an adequate if not better nutritional profile than those of non-Canadian CAI promotions, this was not entirely true. When compared to the UK Nutrient Profile Model, around 80% of Canadian CAI-advertised products were classified in the "less healthy" category as opposed to 55% of the non-Canadian CAI-advertised products (99). Overall, the Canadian CAI pledged companies appeared to have a moderate but positive effect on limiting the number of energy-dense food and beverage promotions targeted at children, however more effort needs to be directed at improving the standards and criteria set for advertisements directed at children.

In contrast, according to the U.S. Children's Food and Beverage Advertising Initiative (CFBAI), advertising during "tween" programming and holiday children's specials is not considered child-directed advertising (100). Nearly half of the food and beverage advertisements viewed by children in the United States are not required to meet the CFBAI guidelines because they are aired during children's programs with less than 35% of child-audience share or viewership (100). The U.S. CFBAI defines child-directed advertising based upon the percentage of the audience comprised of children 12 years and under, often regarded as child-audience share (6). Majority of the food companies under the U.S. CFBAI will use a child-audience share margin of 35% (6). Though recent research cannot be directly compared with the 2004 FTC

analysis (101) of child-directed advertisements, some comparisons can be made. It can be noted that food advertising during peak child viewership (50% or more) has declined (100). In 2004, children aged two to 11 years of age on average viewed close to 2800 food ads during these programs (101), compared with 1600 for preschoolers and 1700 for older children in 2009 (100). In 2004, the number of food and beverage advertisements viewed by children totaled around 2000 during child viewership of less than 20%, while in 2009, children saw more than 2300 ads (101). Though the U.S. CFBAI reports exceptional compliance with voluntary guidelines and pledges, public health researchers have found contrasting evidence. For example, one study found that children were exposed to only four percent fewer advertisements in 2010 vs. 2004 (102), while another study found that children were exposed to seven percent less food ads in 2009 compared to 2003 (103), a very minor improvement. Although U.S. CFBAI protocols have been set to protect children under the age of 12 years, older children and adolescents are not exempted from this and may still be exposed to high levels of food and beverage advertising.

While differences exist in broadcasting regulations between Canada and the U.S., there is an important distinction as many Canadian children are viewing television channels and advertisements originating from the U.S. For instance, television channels such as *Nickelodeon* (owned by Viacom)(104), and *Cartoon Network* (owned by Turner Broadcasting)(105) are often broadcasted on Canadian channels, even though they originate from the U.S. Although the *Canadian Code of Advertising Standards*, monitored by *Advertising Standards Canada*, inspects various advertising media such as television, newspaper, magazines, radio, etc., to determine compliance with Canadian broadcasting regulations (106), this is not the case with foreign advertisements originating from outside of Canada. These are exempted from Canadian standards unless they identify as a Canadian person or entity (106). Thus, while it may seem that children have some protection within Canada, they are still exposed to a high level of foreign advertisements that do not need to comply with Canadian broadcasting codes.

1.5.2. Food Industry Self-Regulatory Codes

Three self-regulatory codes exist that govern advertising in Canada (See Figure 1. For Canadian regulations involved in food marketing). The *Canadian Code of Advertising Standards* (ASC Code) and the *Broadcast Code for Advertising to Children* (Children's Code) are both managed by *Advertising Standards Canada* (ASC), a trade association constituting close to 200 member companies (106). The Children's Code provides guidance to advertising agencies in

developing commercial messages that recognize children's unique characteristics. It outlines specific criteria on what is allowed and not allowed when communicating with children to ensure that they are protected from false advertising (107). For example, the Children's Code states that during a 30 minute program, no commercial can be repeated (107). In children's programs that exceed 30 minutes, a commercial can be repeated or a different commercial advertising the same product is permitted (107). The third self-regulating code is the *Code of Ethics and Standards of Practice* and is managed under the *Canadian Marketing Association* (108). Although these three codes emphasize the importance of children's vulnerability to advertising, loopholes in the system do exist. For example, section two of the ASC Code (Canadian Marketing Association, 2017)(115) disallows the use of advertisements that is presented in a way that disguises their underlying advertising intent, but the same prohibition is not listed under the Children's Code (106). It also appears that the ASC employs a narrow interpretation of the code under section twelve, as it claims to receive minimum or no complaints regarding advertising directed at children as well as dismissing alleged complaints (109). Additionally, the "background" statements of the Children's Code do not seem to prohibit the use of fantasy when communicating with children, but instead claims that it is appropriate to communicate with this audience in such ways (106).

Through the pre-screening process of children's advertisements, the self-regulating industry codes provide credibility in the public eye. It is possible that this process has helped the food industry avert potential government intervention. These voluntary codes act as a low-cost pre-screening and complaint mechanism, which serves to limit the prospects of public complaints (109). At the same time, there does not appear to be many reports of misleading advertising directed at children by the ASC (110). This could be a result of several reasons. First, complaints related to misleading commercial advertisements under ASC are deemed confidential unless violation of a code is identified (110). Second, all television advertisements including those that are considered misleading are pre-screened by ASC, which prevents ASC from further labelling such advertisements as misleading (106). Third, ASC assumes the right to reject allegations against them if the complaint is associated with intentions to generate publicity (110).

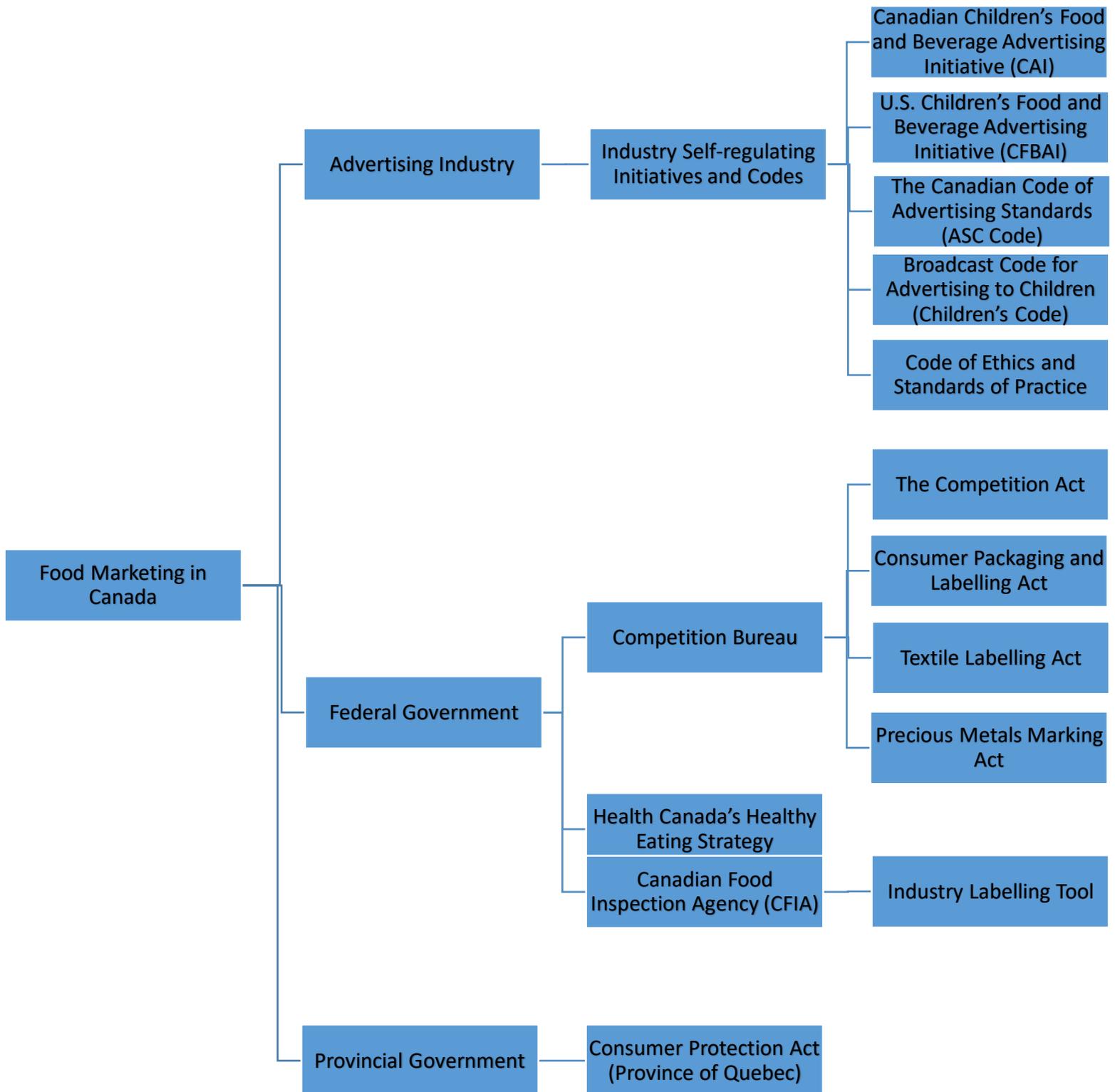


Figure 1. Canadian Regulations for Food Marketing. Food marketing regulations are based on three levels: 1) Food industry self-regulation, 2) Federal government, 3) Provincial government.

1.6.0 Canadian Marketing Regulations: Federal Government

At the federal government level, three regulations have been identified in relation to food marketing to consumers: The Competition Bureau, the Canadian Food Inspection Agency, and Health Canada's role in food marketing to children.

1.6.1 The Competition Bureau

The role of the Competition Bureau is to investigate fraudulent activities related to cartels, stimulate competitive markets, and to protect consumers from deceptive business practices. Four laws have been administered and enforced by the Competition Bureau. First, the *Competition Act*, which covers most businesses in Canada, was created to prevent misleading advertisements and anti-competitive activities of products and services (111). Second, the *Consumer Packaging and Labelling Act* regulates all prepackaged products including the packaging, sale, and advertising of these products (111). Third, the *Textile Labelling Act* protects the labelling, advertising, and sale of textile products (111). Fourth, the *Precious Metals Marking Act* governs the marking of products that contain metals including gold, silver, palladium, and any other metals or an alloy of those metals classified as a precious metal (111).

1.6.2 Canadian Food Inspection Agency: Food and Drugs Act

The purpose of the Food and Drugs Act (FDA) is to protect Canadian consumers against health hazards and from illegal activities related to the sale of foods, drugs, cosmetics, and medical equipment (112). This act prevents the packaging, labelling, and selling of advertised food products that is misleading or deceptive, which includes using health claims to imply that a particular food can prevent, cure, or treat an illness or health condition (112). Similarly, the Food and Drug Regulations (FDR) outline specific criteria for prepackaged food items including nutrition labelling, an ingredient list, an expiration date, health and nutrient content claims (112). Additionally, the Canadian Food Inspection Agency (CFIA) provides detailed information to the food industry with reference to food products that require a label, general principles for labelling and advertising to the general public, as well as allergen labelling tips for packaged food products (112).

1.6.3 Health Canada's Role in Food Marketing to Children

In 2016, a representative from the ministry of Health announced that Health Canada would soon be implementing a new "Healthy Eating Strategy" aimed at helping improve the

health and diet of Canadians. Comparable to the legislation already in place in the province of Quebec, the new legislation (Bill S-228) will further improve current policies to address unhealthy food and beverage marketing to children in the rest of Canada, through a more stringent manner to include food packaging and labelling (113).

Amendments proposed by the new bill include:

- 1) No person shall advertise any food in a manner that is directed primarily at children,
- 2) No person shall label or package any food in a manner that is directed primarily at children,
- 3) No person shall, directly or indirectly, promote a food by means of a testimonial or an endorsement in a manner that is directed primarily at children,
- 4) The depiction of a person, character or animal, whether real or fictional, is considered to be a testimonial or an endorsement (113)

These revisions will ensure that children will be better protected from spokes-character marketing both in broadcast and print media. While the “Healthy Eating Strategy” has been implemented, it is undergoing revision where Health Canada is currently holding round table discussions to engage stakeholders and experts in the field to further improve the strategy (114)

At the moment, Health Canada is pursuing enforceable regulations due to lack of control by the industry to self-regulate effectively. They are currently holding public consultations. Under the *Food and Drugs Act*, the government of Canada will aim to decrease children’s exposure to unhealthy food advertising using various legislative measures that involve: 1) Defining an appropriate age limit for food advertising restrictions, 2) Defining “Unhealthy food” for the purposes of marketing restrictions, 3) Determining if an advertisement is directed at children, 4) Clarifying what marketing techniques should not be restricted (24).

While the number of food advertisements targeting children remain high, advertisements aimed at adolescents have also elevated. Previous research on food marketing focused on children under the age of 13, but current research has shown that adolescents are susceptible to marketing tactics as they tend to be more impulsive, receptive to peer influence, and prefer immediate gratification (115–118). Since the CAI was formed, the number of teen targeted advertisements rose from 15.5% in 2006 to 30.4% in 2011 (97). These numbers are also consistent with data from the United States, where adolescents are targeted more than their younger counterparts (119,120). As a result, Health Canada has proposed that children should be defined as a person under the age of 17.

In order to define “unhealthy foods” for the purpose of marketing, Health Canada is proposing to only allow the marketing of foods that support a healthy pattern of eating (24). A healthy pattern of eating includes “Regular intake of vegetables, fruit, whole grains, and protein-rich foods, inclusion of foods that contain mostly unsaturated fat, instead of foods that contain mostly of saturated fat, and regular intake of water (121).” Under this approach, foods encouraged by Eating Well with Canada’s Food Guide for healthy eating can be marketed to children. Foods considered falling in line with the healthy pattern of eating are (generally) foods that have not been processed, have no added salt, sugar or fat (24). A secondary step involved in defining “unhealthy foods” will be to determine the threshold for foods that contribute to unhealthy patterns of eating (24). This includes limiting foods that contain greater than 5% of the daily value (DV) of saturated fat, sugar, or sodium, or restricting foods that contain greater than 15% of the daily value of saturated fat, sugar, or sodium; the latter being less restrictive than the first (24).

Health Canada will also determine what makes settings and advertising platforms child-directed. Child-directed settings will be defined as public spaces, events, or activities in which a large number of children will be exposed to advertisements (24). Some examples include schools, daycares, recreational centres, grocery stores, hospitals, and amusement parks among others. In the province of Nova Scotia, certain childcare settings are not permitted to serve promotional or branded food during snacks and meal times, and play foods must fit within the four food groups of Canada’s Food Guide (122). Child-directed advertising channels such as television or digital media will be defined as child-directed based on the proportion of children that make up the viewing audience (24). For example, the CAI sets child viewership at 15%. However, these thresholds can often be ineffective as programs or channels that cover sports attract both children and adults tend to have a large number of child viewers even though the percentage of children in the audience is low and within the defined thresholds (100). Another proposed approach involves restricting children’s exposure to advertisements on broadcast media during specific times of the day when children are likely to be watching such as television times between 6pm and 9pm (24)

Health Canada has assumed authority to restrict all forms of marketing in all child-directed communication channels and settings (24). Since it may not be practical to restrict all forms of marketing, Health Canada has chosen to hold public consultations to obtain feedback on

the types of marketing techniques and communication channels that should be considered for restriction.

1.7.0 Canadian Marketing Regulations: Provincial Government

Since 1980, under the *Consumer Protection Act*, the province of Quebec has banned certain television advertisements directed at children under the age of 13 years (123). According to this act, advertising of products that appeal to children (including toys and certain foods such as candies) are prohibited when total child viewership reaches 15% and above for a show (123). If manufacturers wish to advertise products intended for children over 13 years of age and those products also appeal to children under the age of 13, manufacturers may do so once child viewership reaches 15% and above (123). If child viewership dips below 15%, the advertisement must not be designed in a way that interests children. While this act has provided protection for children against food advertising, some limitations do exist. For example, the *Consumer Protection Act* applies only to advertisements that originate from the French language, within the province (123). If children are exposed to advertisements that originate from outside the province (such as cross-border advertising from the United States) those advertisements are exempted from this legislation (124). Thus, English-speaking children in Montreal, watching American and Canadian television stations and networks, were exposed to more advertising compared to French-speaking children, who watched more television from Quebec stations (125).

1.8.0 Perceptions of Healthy vs. Unhealthy

Children use various social, physical, and environmental elements in helping them interpret the healthiness of food products. These include images and texts on the front package, brand mascots, and nutrient specific characteristics of food. For instance, in one study of children in grades one to six, several children stated that a product was healthy “because it has fruit,” by pointing to the peaches and strawberries on the front of the package (51). In another qualitative study with children aged seven to 12 years of age, similar results were found where majority of the children selected fruit drinks as the healthiest products because of the fruits and vegetables on the front package and because they were “full of vitamins,” when in fact the products themselves contained little to no fruit/vegetable content (47). Other children misinterpreted the flavour of the product with a real ingredient, stating that *Grapette Soda* was made with real grapes (47). Additionally, children interpreted text on the front of package seriously and

perceived it to be true. As one child recalls “It says fat free, so you won’t get fat” (51). When these children were questioned on which food product they thought were considered “healthy” they responded using literal interpretations of food packaging text and images.

The same children also associated healthy foods with brand mascots originating directly from the brand lines themselves, such as the mascot from *Quaker Oats*TM (51). In contrast, specific brand mascots, such as *Toucan Sam*TM and *Lucky the Leprechaun*TM, were classified as representing an unhealthy product (51). These differing perceptions of particular spokes-characters associated with “healthy” and “unhealthy” increased exponentially as children got older; 7%, 20%, and 40% in Grades one and two, three and four, and five and six respectively. In fact, the absence of a cartoon spokes-character on the package was perceived as healthy for children. First, children in grades three and four reasoned that a product was healthy because “it has the Quaker dude” on it (51). Second, *Organics Crunch Corn* cereal was considered a healthy choice from another child in grades three and four group because “there’s not a lot of colour and made-up characters on the box” (51). It seems older children were able to recognize the underlying marketing intent of brand mascots in attracting young children to products that exhibited less nutritious products (51). Children differ from adults in interpreting healthy foods because of their judgment and reliance on the physical and aesthetics characteristics of food products.

Another element children may use to interpret the healthiness of foods is nutrient specific characteristics. In a study involving both children and their parents, children were asked to place various beverages along a 3 meter line ranging from “unhealthy” to “healthy” as part of a sorting task (126). All participants were informed that tied ranking was allowed and that they could use the entire length of the line (126). After completing the beverage-sorting task, children mentioned sugar as being the most critical factor in determining the beverage’s health content along with caffeine, and artificial sweeteners (126). The fruit content of a beverage was rated as a slightly more important health factor for children than parents, which could have led to potential mean differences when rating beverages like grapefruit soda, orange juice, and multi-fruit juice (126). This is because children learn from parents at a young age that specific food groups such as fruits and vegetables, are considered healthy. While current literature includes some data on the effects of spokes-character marketing on food choices in children (89–91,94), less data is available on spokes-character marketing and perceived healthiness of food.

Adults on the other hand, have a distinctive difference in their understanding of health and food. In one Canadian study using a photovoice project, researchers explored how people made sense of “healthy eating” (127). Several thematic responses were collected including food quality such as “fresh” and “avoiding junk food,” eating fruits and vegetables, food quantity including eating in moderation, variety, and balance, eating local foods and from farmers’ markets/gardens, as well as following Eating Well with Canada’s Food Guide (127). Similarly, adults from another study conducted by Cloutier, Mongeau, Pageau, Provencher, 2013 (128) perceived healthy foods in terms of food groups including fruits and vegetables, as well as unhealthy foods. These food groups were evaluated based on their nutrient content such as the amount of sodium and fat present within the food. Additionally, Bucher and Siegrist, 2015 (126), found that when parents were instructed to place several beverages along a 3m line ranging from “unhealthy” to “healthy,” sugar content of the drink was the most important criteria along with caffeine, and artificial sweeteners. Overall, healthy eating and healthy food products interpreted by adults tend to fall within several common categories. These include nutrient content of the food itself, including the amount of sugar, fat, sodium, and caffeine, association with food groups (fruits and vegetables are considered healthy compared to packaged food items), healthy eating in the social and cultural context (eating local), and learned knowledge from public health resources such as Canada’s Food Guide or from a healthcare practitioner.

Differences in how children and adults interpret a product’s level of nutrition demonstrate that these two groups base their food choices and food preferences on different factors. Adults may have a greater level of knowledge when referencing nutrition terms, and thus include a larger scope of definitions and ideas when interpreting healthy foods from less healthy foods. They will incorporate broader ideas of nutrition that include the social, cultural, and environmental meanings. Children on the other hand, perceive nutrition in more literal terms and rely on visual elements to form concrete notions of healthy foods and unhealthy foods regardless if they understand the marketing intent of having fruits/vegetables as visual aids on the front of the package. Since children have limited knowledge, their perceptions and understanding of nutrition and healthy eating tend to be formed from parental teachings and other forms of environmental aids that will help them make sense of what is presented to them. Also, many of the influences on food choices are likely to be facilitated by an individual’s attitude and beliefs about health and food, which ultimately leads to a behaviour change. According to the Theory of

Planned Behaviour, behavioural intention to perform is mediated by attitude, subjective norms, and perceived behavioural control (95). While differences exist in how children and adults perceive the healthiness of a product, both groups are still swayed by positive or negative attitudes, social pressures to conform, as well as the level of difficulty it takes to act on their behaviour (95).

1.8.1 Healthy Eating Index Scores

An approach for assessing the healthiness of food known well among nutritional scientists and nutrition professions is the Healthy Eating Index. This scoring system was originally created under the U.S. Department of Agriculture and was used to assess the diet quality of the American population (129). Two components of diet quality are measured using the Healthy Eating Index: Adequacy and moderation (129). Although American and Canadian guidelines differ slightly, both the American Food Pyramid and Canada's Food Guide were designed to meet similar dietary recommendations (129). While the American index provides recommended intakes of foods expressed per 1,000 calories of total intake, the Canadian adaptation is based on the food groups present in the Canada's Food Guide (129). Assessment of diet quality is completed by comparing the intake of the four food groups derived from Canada's Food Guide. This adaptation consists of eight adequacy components (total fruit, whole fruit, total vegetables, dark green and orange vegetables and legumes, total grains, whole grains, milk and alternatives, meat and alternatives, as well as unsaturated fats) in addition to three moderation components (saturated fats, sodium, and solid fats, alcohol, and other sugars)(129). In both indexes, the maximum possible score is 100 points. Final Healthy Eating Index scores in the Canadian adaptation are rated as a good diet (>80 points), a diet that needs improvement (51-80 points), or a poor diet (<50 points)(129,130).

In a similar study using thematic analysis of 24 in-depth interviews, Healthy Plate Scores (HPS) were developed to assess diet quality (131). For Healthy Plate Scores, supper meals for participants (using 24-hour recalls) were created using a visual representation of a plate model divided into several sections: vegetables and fruit, grains, meat and alternatives, a beverage, and dessert (131). Canada's Food Guide was used as a reference for portion sizes and the four food groups. Other factors that were noted included were method of meal preparation, other desserts, beverages, and condiments that were eaten at the meal, other people present during the meal, as well as the time and place of the meal (131). Using the HEI scoring system as a foundation, six

diet-related questions were developed and applied to the supper meal. Scores ranged from 0 (poor-quality diet) to 6 (optimal-quality diet)(131). Whereas the above-mentioned means used to describe healthy and unhealthy by children and adults are subjective measures, the Healthy Eating Index and the Healthy Plate Score provides a more objective assessment of healthy and unhealthy foods in the diet.

1.8.2 Health Professionals and Healthy vs. Unhealthy

In a global review of what governments in various countries have accomplished so far in their efforts to define the terms “healthy” and “unhealthy,” it was found that there continues to be a struggle for an appropriate definition of these terms. Public health policies affected by the challenge of defining “healthy” and “unhealthy” can be classified under six areas:

- 1) Foods with added nutrients or health qualities i.e. food fortification,
- 2) Food labelling such as nutrition and health claims,
- 3) Food product development,
- 4) Foods in public settings such as foods available in school cafeterias and vending machines,
- 5) Food advertising and promotion (food marketing) to children,
- 6) Food programs to support vulnerable populations i.e. food banks (132).

While various nutrition classification systems were developed including the Guiding Stars system in the United States, the Green Keyhole in Sweden, and the Traffic Light System in the United Kingdom (among many others), it appears governments, not-for-profit organizations (NGOs), and the food industry tend to evade the explicit proposition that there are “good” and “bad” foods. For instance, the Ministries of Health and Education in Portugal have commented that “It is not possible to categorically say there are bad foods, but there are foods with nutritional characteristics that mean they should not be freely available in schools” (133). Similarly, in New Zealand and Australia, the Food Standards Authority declared that “There are highly diverse views as to whether food eligibility criteria should be applied at all, and if so, which foods should be ‘in’ or ‘out.’ We also acknowledge that diets are made up of a variety of foods and no one food can be considered as ‘good’ or as ‘bad’”(134). Defining healthy and unhealthy is a controversial issue, especially from a government perspective. It seems health professionals are moving away from labelling a particular food as healthy or unhealthy and

instead are looking for ways to define the health of foods in different contexts (132). For example, who is it healthy for? Defining when, where, and for whom these foods are unhealthy is a better way of interpreting the healthiness of a single food (132).

Chapter 2.0: Rationale, Research Question, Objectives

2.0 Rationale

Spokes-characters are a marketing tool for food companies, used with the aim of building brand loyalty and leveraging emotional relationships with children, by transferring the affection, warmth, and sincerity of an actual personality into the product (9,10,135). Research on pediatric cognitive development show that children are vulnerable to food advertisements due to their limited capacity to recognize an advertisement's selling intent, thus leaving them receptive and prone to misleading advertisements (82). To date, a number of studies have examined food advertising impacts on children's cognitive and behavioural outcomes, including spokes-character preferences, food and taste preferences, as well as purchase requests (55,89–91,94,136). Currently, there are very few experimental studies exclusively studying children's perceived healthiness of advertised food products using spokes-character marketing. Previous research on spokes-character marketing explored children's perceptions of a healthy product using a qualitative approach, however this was limited to asking children which product they thought was the "most healthy" or "good for you" (51). It did not factor in a quantitative approach in measuring how healthy children evaluated a product to be. This thesis was developed to further examine children's perceived healthiness of food products (breakfast cereals) using the VAS to quantify a healthiness rating from zero to 100, both in the presence and absence of spokes-characters on the front package. This study integrated a mixed-methods approach in data collection whereas other studies used only a single qualitative approach (51,89).

2.1 Research Question

How does front of package spokes-character marketing influence seven to eight-year-old girls' perceptions of healthiness on ready-to-eat (RTE) breakfast cereals in Halifax, Nova Scotia?

2.2 Objectives

1. To determine if children will rate breakfast cereals as healthy or unhealthy based on the presence of spokes-characters, other images and/or text they see on the front package.
2. To determine if children will rate breakfast cereals as healthy or unhealthy based on the presence of "other" (non-spokes-character) images and/or text they see on the front package.

Chapter 3.0: Methods

3.0 Study Design and Sampling Technique

This study is a one-armed observational study, including an administration of a mixed-form questionnaire. Convenience sampling was used. In convenience sampling, members of the target population are chosen through non-probability or non-random sampling (137). Participants were selected based on their geographical proximity and ease of accessibility (138). Advantages include ease of administration, cost effectiveness, and time efficiency (138). A disadvantage is that there is limited generalizability to the greater population aside from the sample being studied (137,138). Although generalizability is a limitation of this sampling technique, the advantages were deemed to outweigh the disadvantages at the thesis proposal stage.

3.1.0 Sample

Our sample consisted of girls aged seven to eight years old from The Girl Guides of Canada (GGC) Brownie units. As mentioned in the literature, children younger than eight years of age lack the cognitive ability to understand and process food advertisements (82), therefore we recruited Brownies for our study. To be eligible to participate in the study, participants had to be participating in a GGC Brownie unit within the Harbourside or Tri-Waters Area. Participants had to be able to read, write, and communicate orally in English.

The GGC is an all-girls community first founded in 1910 by Baden-Powell in England to provide young girls with adventurous opportunities similar to that of boy scouts (139). Today, the GGC Guiding program encourages girls to learn about science and technology, career opportunities, cultural diversity, as well as the arts (139). Girls in guiding will also explore important subjects relating to self-esteem, body image, and bullying (139). Adult members of the program act as female role models to support younger girls to develop life and career skills through fun activities, challenges as well as international experience (139).

A 15-20% participant dropout rate was predicted based upon previous work (140). Given the low participant burden of this study, a 10% correction rate was used in the power analysis below. Since only one study visit was required for each Brownie unit, the probability of participant dropout was predicted to be low. The estimated sample size was 45 participants based on the below calculation.

$$n_1 = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (\sigma_1^2 + \sigma_2^2 / \lambda)}{\delta^2}$$

$$N = \frac{[1.96+0.9]^2 [(2.0)^2 + (1.4)^2]}{(4.1-2.9)}$$

$$= \frac{(8.1796)(4 + 1.96)}{1.2}$$

$$= \frac{8.1796 \times 5.96}{1.2}$$

$$= 40.6 \text{ participants}$$

41 participants x 10% correction for drop out = 4 additional participants

$$41 + 4 = 45 \text{ participants (140)}$$

After discussing with the authors of this paper, it was recommended that a few assumptions be made regarding our participants. Participants were assumed to be similar to the national average for screen time, exposure to Canadian and potentially American advertisements from television broadcasting, as well as familiarity with spokes-characters broadcasted on television. Participants were also assumed to be familiar with the brand mascots that were present on the front package of breakfast cereals as well as the different brands of breakfast cereals presented to them during the study. Screen time data was not collected from this sample.

3.2.0 Recruitment

Research ethics approval was obtained from Mount Saint Vincent University's Research Ethics Board (UREB) in May 2017 (See **Appendix A**). The Area Commissioner of the Harbourside Area was contacted in January 2018, and the Area Commissioner for the Tri-Waters Area was contacted in September 2018, for permission to recruit Brownie units for the current study. After permission was obtained, both Area Commissioners contacted Brownie units on our behalf. Four Brownie units expressed interest in participating in the study: Brookside Junior High from Hatchet Lake, NS, St. Aiden's Church from Halifax, NS, Sackville Heights Community Centre from Lower Sackville, NS, and St. Andrew's Church from Halifax, NS. The

Study Coordinator (MSc Candidate Gillian Chu) received an email from each interested unit and proceeded to arrange a meeting with Brownie leaders and their respective units.

The Study Coordinator and Research Assistant attended three meetings with each of the four Brownie units. During the first (recruitment) meeting, the Study Coordinator and Research Assistant introduced themselves to the Brownie unit and gave a presentation related to research and science. Consent forms (See **Appendix B**) and assent forms (See **Appendix C**) were distributed on the first meeting to Brownies in the Harbourside Area and were provided with a post-marked expressed envelope to be delivered back to Mount Saint Vincent University. Consent and assent forms were distributed electronically to Brownie leaders in the Tri-Waters area prior to the first visit, and collected during the same visit. Permission was obtained from UREB to distribute forms electronically to shorten the length of time required during the recruitment process. Data collection methods were unchanged.

3.3.0 Protocol

During the second meeting (study visit), participants were asked to take a seat behind any of the three Bristol board dividers placed in between a long table (See **Appendix D** figure 1. a, b, c, d for pictures of the research study setup). These dividers acted as individual voting stations to discourage participants from sharing answers and opinions while completing the questionnaires. Each of the four seats included a questionnaire booklet for participants to complete. The Study Coordinator delivered a PowerPoint Presentation as part of each study session. This included a brief introduction of both the Study Coordinator and the Research Assistant, addressing issues related to confidentiality, the rationale for conducting this research, as well as outlining the tasks that was required of each participant throughout the duration of the study session.

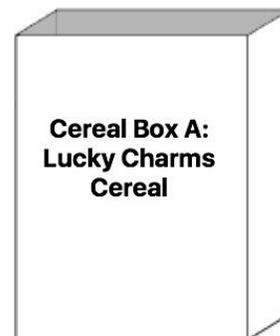
A live demonstration on how to use the VAS line using a flip chart was provided to the Brownies by the Study Coordinator and Research Assistant. A set of three pictures were used: broccoli, French fries, and chocolate milk. These pictures were used by the Study Coordinator and Research Assistant to demonstrate how to place an “X” on the VAS line. After the flip chart demonstration, the Study Coordinator instructed children to start their questionnaire booklet (See **Appendix E**). The first question asked if children perceived the front of the cereal box as healthy or unhealthy, and the second question asked children if they saw anything on the front package that made them perceive the cereal as healthy or unhealthy.

Each set of questionnaires included eight pages of VAS lines corresponding to eight different types of breakfast cereal that was shown to each group of children. There was two that reflect cartoon media characters, two that reflect brand mascots, two that contained no spokes-character marketing on the front of the breakfast cereal box, and two that reflected healthy breakfast cereal advertising (see **Appendix F**). As a result of copyright issues associated with using breakfast cereal images from Kellogg's and General Mills, blank cereal boxes were created as a substitution identical to the ones in Figure 2 and 3. During the actual study, the front of the breakfast cereal boxes were shown to the participants instead.

Figure 2. Frosted Flakes Cereal



Figure 3. Lucky Charms Cereal



These are examples of blank cereal boxes that were used as part of the study intervention. These cereal boxes along with six others were held up one at a time and shown to participants as they answered the FMBC questionnaire.

The Research Assistant held out one cereal box at a time for a total of eight times while the Study Coordinator was speaking throughout the PowerPoint presentation. The Study Coordinator also held up the cereal boxes when the Research Assistant was busy assisting a participant (See **Appendix D** figure 2. a, b and figure 3. a, b). The Study Coordinator and/or Research Assistant walked around the front of the table (between the Bristol board dividers) to each participant with the cereal boxes. This allowed children to take a closer look at the cereal boxes and to ask questions if they were unsure how to complete the VAS lines. This process continued until all eight pages of the questionnaire was completed (See **Appendix E** for FMBC

questionnaire). Once participants completed their questionnaire booklet, the Study Coordinator collected the questionnaires and placed them immediately into a large box with an opening for transport back to Mount Saint Vincent University.

A protocol (See **Appendix G**) was also developed to determine when it would be appropriate for the research team to assist the Brownies. There were two steps involved in the BAP. The first step involved identifying participant needs. Participants requiring minimal assistance were classified as those requiring help with spelling and grammar. Participants requiring extensive assistance were classified as those who required help interpreting the question. This also includes participants who asked specific questions relating to the contents of the cereal box being shown to them. The second step involved marking participant questionnaires with a green or red dot. A green dot indicated a participant who required minimal assistance and a red dot indicated a participant who required extensive assistance.

During the third meeting with the Brownie units, the Study Coordinator and Research Assistant provided nutrition activities to the Brownies in order to help them work towards earning their nutrition badge. Nutrition activities were focused on macronutrients, micronutrients, and nutrition labelling.

3.4.0 Data Collection Tool

The VAS is a straight line where each opposing end is representative of the extreme limits that measure a specific characteristic (141). The VAS has been used in various research and clinical settings, most notably for pain measurement in children (142–145). In such instances, VAS generally involves a 100mm horizontal line with several indicators identified as anchors. These anchors provide an indicator of the distance along the horizontal line from one end point to another. At the left end point it is marked as “no pain,” and at the right end point it is marked as the “worst pain possible” (146). Typically, the child will be asked to place a vertical mark anywhere along the 100mm line to specify how much pain they feel (146). For example, researchers calculate pain intensity scores by measuring the distance from the left end point to the child’s vertical mark along the scale (146)

There are several advantages of using the VAS. Compared to other psychometric scales such as the Likert scale, the VAS measures responses on a continuum rather than discrete categories, thus it is sensitive and able to detect small changes (147). It is also labelled as being easy to understand and use, especially among immigrants and those with lower education and

socioeconomic status (148–151). Other advantages include the low cost of administration and its ability to produce ratio data (146). The VAS has been successfully applied to other areas of research aside from pain measurement in children. For example, Bucher and Siegrist (126) adapted the VAS into a scale stretching 3m long. The left end point signified unhealthy and the right end point signified healthy. Children were instructed to place various soft drinks along the line, where they were informed that tied ranking of beverages was allowed, and that they could use the entire length of the 3m line (126). After completing the beverage sorting task, the distance of each beverage from the unhealthy left end of the 3m line was measured (unhealthy end was used as the reference point)(126). The closer the beverage was to the reference point, the less healthy it was perceived by the children. Similarly, the further away the beverage was to the reference point, the healthier it was perceived (126). However, weaknesses also exist in using the VAS. For instance, it requires a greater amount of time for instruction and administration, and normally entails more work compared to using a Likert scale (152–154). It may also prove to be difficult to administer to young children as they may not entirely understand and answer the VAS correctly (155). On the other hand, young children who have lower literacy skills have been predicted to prefer the VAS because it places less demand on reading time and skills compared to the Likert scale (149).

Several factors affect a child's ability to use a VAS. Previous research has demonstrated a correlation between a child's cognitive skills and their ability to use various rating scales, such as the VAS (156–158). As well, a child's estimated IQ (>100) and age (>5.6 years) was found to be a very good indicator of a kindergarten child's (age 5-6 years) ability to use a VAS (158). This correlation between cognitive abilities and age implies that the younger the child, the greater the estimated IQ required to effectively perform a task using the VAS (136). On the other hand, the older the child, the lower the IQ needed to successfully complete the VAS (158). However, controversy exists within the literature regarding the best age at which children are able to understand and utilize a VAS. For instance, some researchers have proposed that the VAS is reliable for children over the age of five years (159,160), whereas other authors have found that young children (<7 years) do not have the cognitive capacity to use the VAS (142,156). Since the age of the participants will be between seven and eight years, the VAS was determined to be an appropriate tool for collecting data from this age group.

3.5.0 Data Analysis

Data collected from the FMBC questionnaires were inputted into Microsoft Excel spreadsheets and analyzed using IBM SPSS Version 25 (Copyright © IBM Corporation and other(s) 1989, 2012). There was a total of four different variables: breakfast cereals with brand mascot advertising, breakfast cereals with cartoon media character advertising, breakfast cereals with no spokes-character advertising, and healthy breakfast cereal advertising. The scores of each breakfast cereal were measured using a ruler and totaled out of 100 points. The VAS score was calculated using the following formula:

$$\text{VAS Score} = \text{Distance from the left end point} / \text{Total distance along the VAS line}$$
$$(\text{Distance from the left end point}) \text{ mm} / 100\text{mm}$$

The mean scores of each breakfast cereal were inputted into SPSS for analysis. A Kruskal-Wallis Test was used in addition to a Dunn's Post Hoc test to determine statistical differences in pairs of breakfast cereals. The Kruskal-Wallis test is a non-parametric test and was used to analyze median VAS scores for the distribution of each breakfast cereal. A 2-sided test of significance was conducted using a 95% confidence level. Analysis was also performed on data that was collected from participants who chose to leave before the end of the study period.

Qualitative analysis was performed on open-ended responses collected from part B of each question on the FMBC questionnaire. These responses were organized into themes that were coded into a theme codebook. Participant responses that were two words or less were tallied as part of quantitative data and described as breakfast cereal descriptors. Participant responses that were greater than two words were considered quotes and included into a theme codebook.

3.5.1 VAS Score Interpretation

Research has shown that ratings of pain severity be used to group pain intensity scores into distinctive categories (161–163). The three categories most often used to classify pain intensity scores are mild, moderate, and severe (164). There are numerous options for categorizing scores into several groups. For instance, in one study, researchers looking at the distribution of VAS scores in postsurgical patients divided patient scores into four categories: no pain (0-4mm), mild pain (5-44mm), moderate pain (45-74mm), and severe pain (75-100mm) (164). In a second study, VAS pain scores were categorized into three groups: VAS scores of less than 34, VAS scores between 34 and 66, and VAS scores of 67 or greater (165). In a third

study, researchers categorized VAS pain scores into five categories: scores one and two into category one, three and four into category two, etc. (149). While there appears to be no standardized cutoff points for classification of VAS scores in research, there does appear to be a consensus that three categories is the most suitable classification system (165–167). For example, Serlin and colleagues found that classifying a score of 1 to 4 as mild pain, 5 to 6 as moderate pain, and 7 to 10 as severe pain provided the most appropriate classification system (166). After discussing with the authors of this paper, the classification of mean VAS scores was as follows: Unhealthy (score of 0 to 40) neither unhealthy nor healthy (score of 41-70), and healthy (score of 71-100). Expanding the classification system beyond three categories would make it more challenging for our participants (seven to eight-year-old females).

3.5.2 Box Plots

Median VAS scores are statistically appropriate when analyzing data using the Kruskal Wallis Test and the Dunn's Post Hoc Test. Median VAS scores can also be graphed using boxplots. Boxplots were selected due to their usefulness in presenting data in a graphical way that allows for comparisons, interpreting central tendencies, and mapping of outliers, which together can describe the shape of the distribution (168). A box plot is represented by a rectangle (box) with two lines (whiskers)(168). Dispersion of the data set is characterized by the ends of the whiskers while the upper and lower edges of the box represent the first and third quartiles (168). Within and parallel to the rectangular box is a line which indicates the median value of a distribution (168). In this thesis, a boxplot graph will be used to illustrate median VAS scores of breakfast cereals and their distribution.

3.6.0 Data Management

A cardboard box with a small opening was created and placed in the front of the room in order to store hard copies of the completed questionnaires that was collected during each study visit. Participants dropped off their completed questionnaire into the box at the end of their study session. This provided increased anonymity, especially during transport of data from the study site to the Grant Lab at Mount Saint Vincent University. Questionnaires were scanned and converted into electronic data. All hard copies of the data were shredded onsite at MSVU. All electronic data was stored on a database (student H drive) on the MSVU campus computers and any data that was analyzed was anonymous.

3.7.0 Dissemination of Research Results

Upon completing the final thesis defense in Fall 2018, a manuscript will be written and uploaded to the MSVU library. Participants and members of the Girl Guides of Canada were provided a link to access the final Master's thesis online via the Mount E-commons website accessible at <http://dc.msvu.ca:8080/xmlui/>. Research results may be disseminated through conferences and/or seminars should the opportunity arise.

Chapter 4.0 Results

4.0 Participants

The Area Commissioner of the Harbourside Area was contacted in early January of 2018 for permission to recruit Brownie units for the current study (See Figure 4 below for recruitment flow chart). After permission was obtained, the Area Commissioners contacted Brownie units on our behalf. Between February/March 2018, two Brownie units expressed interest in participating in the study: Brookside Junior High from Hatched Lake, NS and St. Aiden's Church from Halifax, NS. The Study Coordinator and the Research Assistant attended the first meeting and administered consent and assent forms to potential participants. Fourteen Brownies provided consent to participate in our study. During the study visit to St. Aiden's Church, one participant dropped out of the study due to being absent and ill.

The Area Commissioner for the Tri-Waters Area was contacted in September 2018 for permission to recruit Brownie units. After permission was obtained, the Area Commissioners contacted Brownie units on our behalf. In October 2018, two additional Brownie units expressed interest in participating in the study: Sackville Heights Community Centre from Lower Sackville, NS, and St. Andrew's Church from Halifax, NS. The Study Coordinator administered consent and assent forms electronically to Brownie unit leaders and obtained consent forms back from Brownies during the first meeting. Twenty-one Brownies provided consent to participate in the study. This provided a total of 34 Brownies/participants from four Brownie units aged seven to eight years old. Participant demographics were not collected.

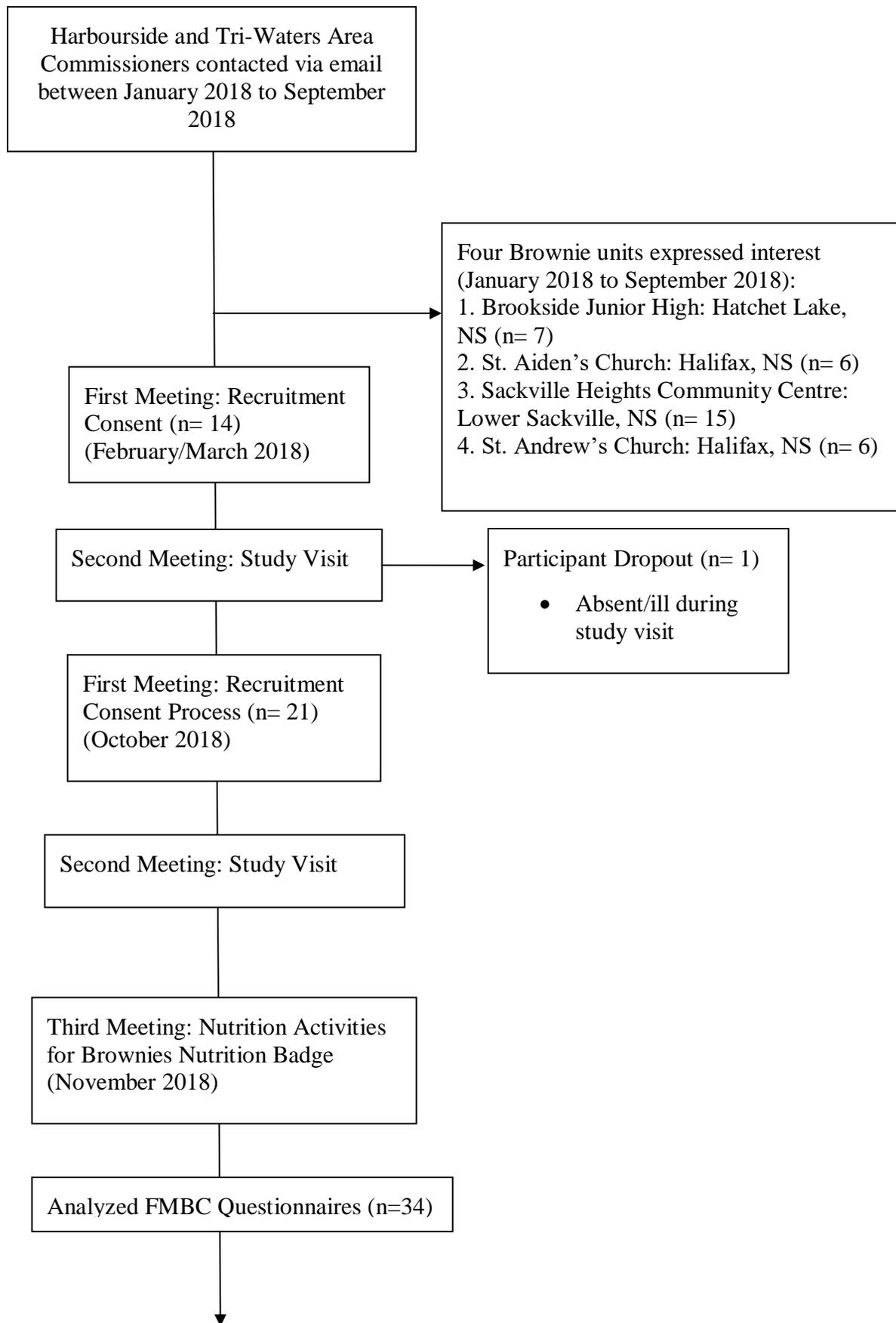
4.1.0 Close-ended Question Responses

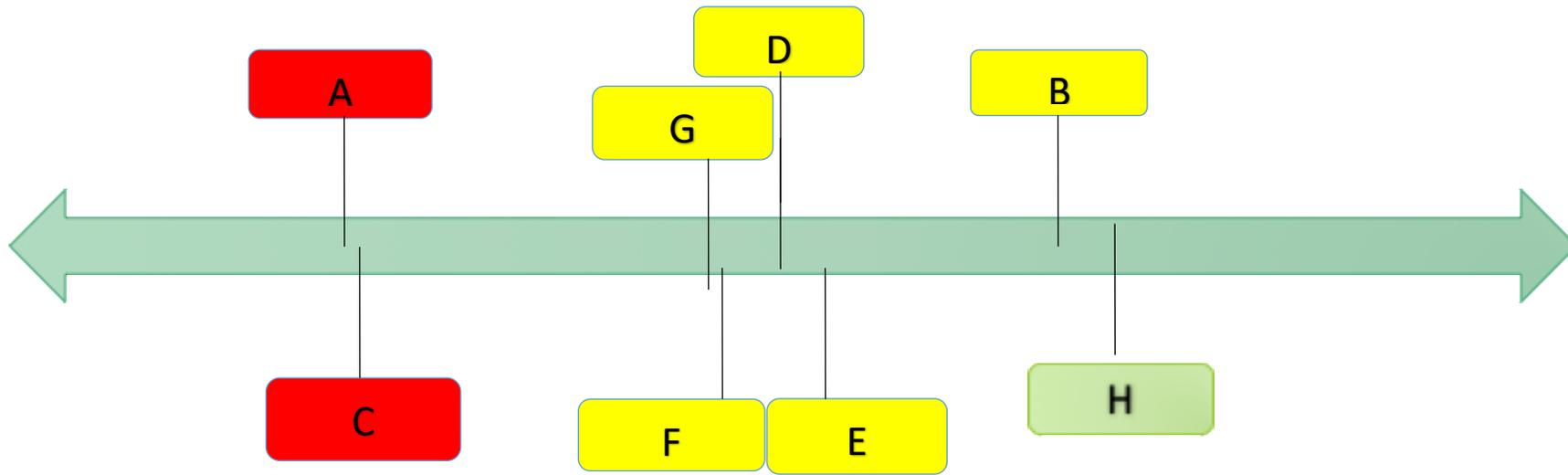
In Figure 5, mean VAS scores of eight different breakfast cereals have been plotted along a 100mm line. The mean (\pm SD) VAS score for cereals categorized as unhealthy were: Lucky Charms 21.0 ± 18.6 and Star Wars 22.3 ± 13.5 . The mean (\pm SD) VAS score for cereals categorized as neither unhealthy nor healthy were: Corn Pops: 44.4 ± 20.8 , Golden Graham Crunch: 50.2 ± 21.9 , Frosted Flakes: 45.0 ± 27.3 , Frozen Frosted Cheerios: 54.5 ± 21.8 , and Cheerios 68.5 ± 22.6 . The mean (\pm SD) VAS score for cereal categorized as healthy was: Spoon Size Shredded Wheat: 72.9 ± 19.4 .

Lucky Charms and Star Wars were ranked as unhealthy with a mean VAS score between 0-40, and therefore was colour coded red. Cheerios, Golden Graham Crunch, Frozen Frosted Cheerios, Frosted Flakes, and Corn Pops were ranked as neither unhealthy nor healthy with a

mean VAS score of 41-70, and therefore was colour coded yellow. Spoon Size Shredded Wheat was ranked as healthy with a mean VAS score of 71-100, and therefore was colour coded green. These findings were comparable to qualitative findings. For example, participants mentioned that marshmallows were associated with an unhealthy product in their open-ended responses, which was found in both Lucky Charms and Star Wars, hence they were ranked as unhealthy as evidenced by mean VAS scores (21.0 ± 18.6 and 22.3 ± 13.5 respectively). On the other hand, participants mentioned in their open-ended responses that grain was associated with a healthy product which was found in Spoon Size Shredded Wheat, hence it was ranked as healthy (72.9 ± 19.4).

Figure 4. Brownie Recruitment Flow Chart





Legend			
Letter	Breakfast Cereal	Mean	Healthiness Category
A	Lucky Charms	21.0±18.6	Unhealthy
B	Cheerios	68.5±22.6	Neither unhealthy nor healthy
C	Star Wars	22.3±13.5	Unhealthy
D	Golden Graham Crunch	50.2±21.9	Neither unhealthy nor healthy
E	Frozen Frosted Cheerios	54.5±21.8	Neither unhealthy nor healthy
F	Frosted Flakes	45.0±27.3	Neither unhealthy nor healthy
G	Corn Pops	44.4±20.8	Neither unhealthy nor healthy
H	Spoon Size Shredded Wheat	72.9±19.4	Healthy

Figure 5. Legend of Mean (\pm SD) VAS Scores and Healthiness Ranking.

Figure 6 below is a boxplot that compares the distribution of median VAS scores across each of the eight breakfast cereals. Based on the boxplot, Lucky Charms had the shortest whiskers, indicating a smaller variance in extreme values. Participant agreement on the VAS score rating for Lucky Charms and Star Wars were comparable. These two breakfast cereals had the lowest median scores compared to the other six breakfast cereals, thus were rated as less healthy. Two outliers were also presented on the boxplot; an extreme value is present for Lucky Charms cereal and Cheerios cereal. Six of the breakfast cereals including Cheerios, Golden Graham Crunch, Frozen Frosted Cheerios, Frosted Flakes, Corn Pops, and Spoon Size Shredded Wheat appeared to have a large variance in either the lower values or both the lower and upper values as indicated by long whiskers. Spoon Size Shredded Wheat had the highest median VAS score at 77. There was a higher agreement of VAS score rating by participants for Spoon Size Shredded Wheat in the higher values (towards healthy) compared to the lower values (towards unhealthy), as indicated by a short whisker above the box and a long whisker below the box.

Mean VAS scores were examined initially for categorization into three different groups, however upon testing for normality of the data, majority of breakfast cereal categories were normal (only two groups were non-normal). Hence, normal scores would have been analyzed using ANOVA while non-normal scores would have been analyzed using the Kruskal-Wallis Test, however when testing for homogeneity of variance using Levene's Test, this assumption was not met. Therefore, the Kruskal-Wallis Test was used to compare median VAS scores. When comparing means above in Figure 5 with medians below in Figure 6, some scores were higher and some were lower. For example, the mean VAS score for Lucky Charms was 21.0 but when compared to the median VAS score, it was 15.5. Golden Graham Crunch had a mean VAS score of 50.2 but when compared to the median VAS score it was 47.5. When comparing all breakfast cereal means with medians, healthiness categories did not change for seven of the breakfast cereals, with the exception of one. Cheerios moved from the category of neither unhealthy nor healthy (score of 41-70) to healthy (score of 71-100). It appears there was some non-agreement from participants. For example, when analyzing open-ended responses, half of the responses mentioned that honey was associated with being healthy while the other half associated it as being unhealthy, which would indicate that it would be near the middle (neither unhealthy nor healthy). This is not surprising considering that the boxplot for Cheerios shows a

high level of non-agreement in the lower values compared to the higher values as indicated by long whiskers on the bottom and short whiskers on the top.

4.1.1 Comparison of Breakfast Cereal Pairs

Post hoc analysis showed significant differences between breakfast cereals. The legend below presents data on pairs of breakfast cereals that were significantly different from the others. Significant differences (p values) listed below are all <0.05 . Breakfast cereals on the right column are matched to the breakfast cereals in the left column. Breakfast cereal A (Lucky Charms) and C (Star Wars) are both significantly different and less healthy compared to breakfast cereals B, D, E, F, G, and H. Breakfast Cereal D (Golden Graham Crunch) is less healthy compared to breakfast cereal H (Spoon Size Shredded Wheat). Breakfast cereal F (Frosted Flakes) and G (Corn Pops) are less healthy compared to breakfast cereal B (Cheerios) and H (Spoon Size Shredded Wheat). The largest differences were between four cereal pairs: 1) Star Wars and Spoon Size Shredded Wheat ($H = -147.23$, $p < 0.05$), 2) Lucky Charms and Cheerios ($H = -133.9$, $p < 0.05$), 3) Star Wars and Cheerios ($H = 132.3$, $p < 0.05$), and 4) Star Wars and Spoon Size Shredded Wheat ($H = -145.7$, $p < 0.05$).

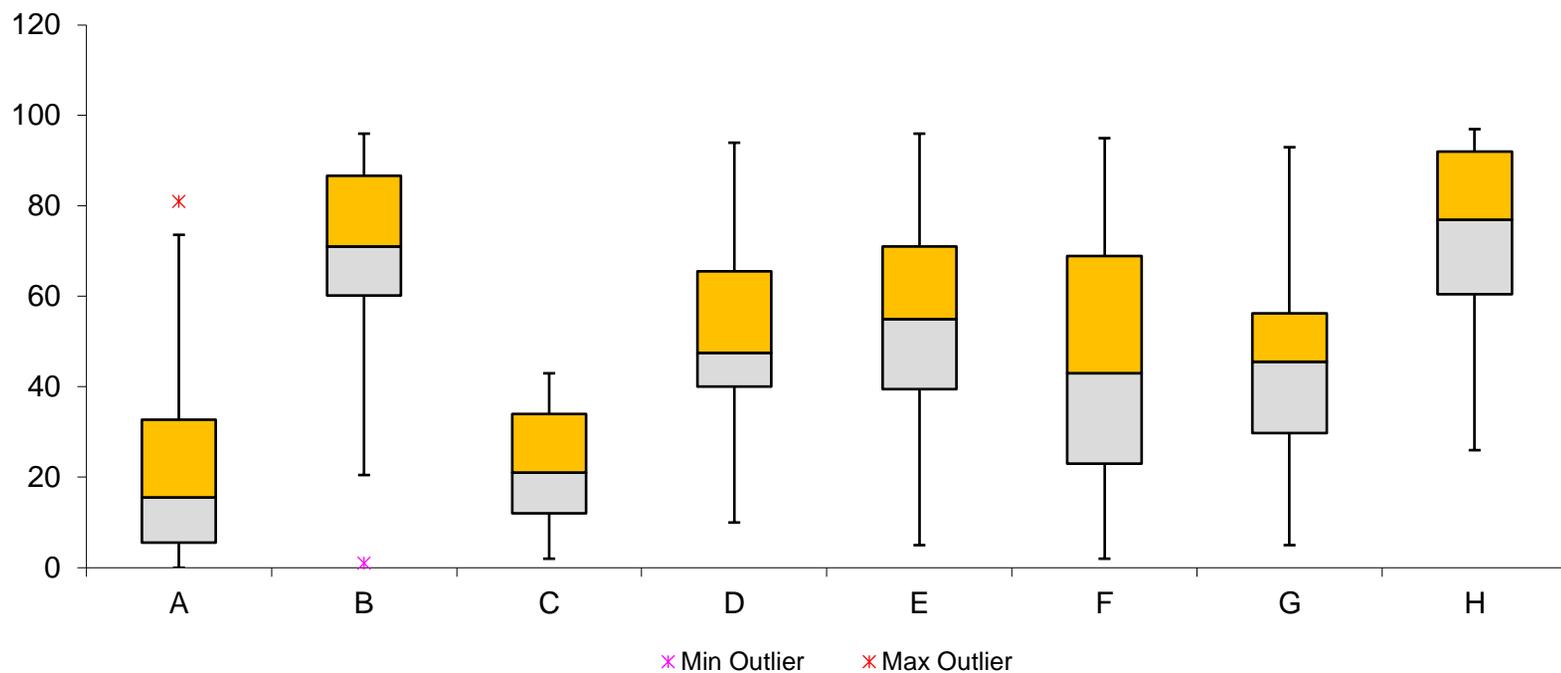


Figure 6. Boxplots of Median VAS Scores

Legend			
Letter	Breakfast Cereal	Corresponding Breakfast Cereal Pairs	Significance Value (p)
A	Lucky Charms	B, D, E, F, G, H	p<0.05
B	Cheerios	-	-
C	Star Wars	B, D, E, F, G, H	p<0.05
D	Golden Graham Crunch	H	p<0.05
E	Frozen Frosted Cheerios	-	-
F	Frosted Flakes	B, H	p<0.05
G	Corn Pops	B, H	p<0.05
H	Spoon Size Shredded Wheat	-	-

4.1.2 Breakfast Cereal Descriptors

During analysis, open-ended responses were categorized as descriptors or quotes. Breakfast cereal descriptors were defined as open-ended responses of two words or less while quotes were defined as open-ended responses of three or more words. Responses with two words or less were tallied under 16 different categories listed below in Table 1. Marshmallows and sugar were still the most mentioned words by participants, similar to that found in the quotes. In total, 47 responses with two words or less were accounted for.

Table 1. Tally of Participant breakfast cereal descriptors

Participant Descriptors	Number of Responses
Marshmallows	12
Sugar	12
Wheat	4
Corn	1
Berries	2
Colour	2
Honey	2
Nothing	3
Healthy	1
Salt	1
Ordinary	1
Very Good	1
Good	2
100%	1
Kellogg's	1
Post	1
	Total= 47

4.2.0 Theme Codebook.

Qualitative themes were grouped under three categories below in Table 2 under Level One. When moving from Level One to Level Three, themes become more specific. For example, each theme in Level One is divided into sub-themes in Level Two and Level Three. In Level One, three themes are present. Participants who did not provide a response in part B of the FMBC questionnaire were coded as 100 under no response provided. Responses that made mention of images and text on the front package of the breakfast cereal were coded as 200 under contents found on the front of cereal box. Responses that did not speak directly about images and text from the front of the cereal box were coded as 300 under other responses. Majority of open-

ended responses were based on content found on the front of the cereal box (coded as 200). This included two Level Two sub-themes: 1) Images (coded as 201) and 2) Front of Package Text and/or Nutrient Content Claims (coded as 202). Level Three sub-themes for images included spokes-characters, marshmallows, sugar, grain, fruit/vegetable, and honey. Level Three sub-themes for front of package text and/or nutrient content claims included “No artificial flavours or colours,” “Made with whole grain gluten-free oats,” “100% natural whole grain wheat,” the weight of the cereal box (340g), “They’re magically delicious,” the front-of-package nutrition label, and “Deliciously sweetened graham cracker flavoured cereal.”

Ambiguous responses as a sub-theme (coded as 301) included quotes from participants that said “I don’t know” and responses that were not related to images or text and/or nutrient content claims found on the front of the breakfast cereal package. Some examples include “A little bit of both” (A7), “It just look like it is unhealthy” (B1), “In the middle 100%” (C11), and “A little healthy” (C13). Participant quotes have been assigned a group letter and participant number based on the corresponding Brownie unit (i.e. St. Aiden’s Church, Brookside Junior High, etc.). The following letters A, B, C, D were assigned to each of the four Brownie units for labelling of quotes in the Table 3 below.

Table 2. FMBC Questionnaire Theme Codebook. Qualitative themes are grouped under three categories: No answer/comment provided (100), Content found on the front of cereal box (200), and Other responses (300).

Level			Theme
1	2	3	
100			No response provided
200			Content found on front of cereal box
	201		Images
		201.1	Spokes-character
		201.2	Marshmallows
		201.3	Sugar
		201.4	Grain
		201.5	Fruit/vegetable

		201.6	Honey
	202		Front of Package Text and/or Nutrient Content Claims
		202.1	“No artificial flavours or colours”
		202.2	“Made with whole grain gluten-free oats”
		202.3	“100% natural whole grain wheat”
		202.4	Weight of cereal in the box (340g)
		202.5	“They’re magically delicious!”
		202.6	Front-of-Package Nutrition Label
		202.7	“Deliciously sweetened graham cracker flavoured cereal”
300			Other Responses
	301		Ambiguous
		301.1	“I don’t know”
		301.2	Responses that were unrelated to the front package of cereal

4.3.0 Open-ended Question Responses

Table 3 presents qualitative data collected on the Food Marketing and Breakfast Cereal (FMBC) questionnaire (See **Appendix E**) administered to participants. Participants were asked two questions on the FMBC questionnaire:

- 1) “How healthy is this breakfast cereal?”
- 2) “What do you see on the front package that makes you think the cereal is healthy or unhealthy?”

The second question is the most important question because it relates to the research question and helps to determine if spokes-characters on the front package made a difference in children’s perceived healthiness of the breakfast cereal. Table 3 provides a comparison of sub themes, the association of these sub-themes with products considered to be unhealthy, neither unhealthy nor healthy, and healthy, the number of quotes or open-ended responses, breakfast

cereals associated with the sub-themes, and examples of participant quotes. Participant quotes have been assigned with a group letter and a participant number.

A major sub-theme that emerged from qualitative analysis was marshmallows. In the current study, 13 quotes mentioned marshmallows in their response of the second question of the FMBC questionnaire. Based on these 13 responses, cereals that contained marshmallows in them were mostly rated as an unhealthy product (score of 0-40). Marshmallows were present in Lucky Charms and Star Wars cereal, therefore these two breakfast cereals were coded red above in Figure 5. While colour was mentioned a few times, it was most likely referring to the colour present on the marshmallows, and was therefore coded as part of the sub-theme marshmallows. Additionally, 24 responses talked about sugar being present in cereals. Sugar was identified as being in almost all cereals, however it was only mentioned once for Cheerios and Spoon Size Shredded Wheat, since majority of participants rated these two as being healthier compared to the other six cereals. Qualitative data showed that 10 responses talked about grain being present visually on the front package. Participants identified them as being present in Cheerios, Corn Pops, Spoon Size Shredded Wheat, and Golden Graham Crunch. These cereals were associated with being healthy (score of 71-100).

Seven responses talked about seeing fruit and/or vegetable present on the front package even though these were not actually present inside the cereal. Breakfast cereals that had fruit/vegetable on the front package was present in Corn Pops, Frosted Flakes, and Spoon Size Shredded Wheat. Breakfast cereals that had fruit/vegetable in them were associated with being healthy (score of 71-100). Three responses talked about honey being present in Cheerios and Golden Graham Crunch. This was an interesting finding as some participants rated breakfast cereals containing honey as healthy while other participants rated it as being unhealthy because it was related to sugar. Overall, the breakfast cereals that contained honey in them were rated as neither unhealthy nor healthy (score of 41-70). While spokes-characters was the outcome of interest, only one participant mentioned this. This participant mentioned that spokes-characters was present on the front of Frosted Flakes in which the cereal was rated as unhealthy, and said “There’s a character on the box” (C4).

In terms of text and nutrient content claims on the front package, five responses made mention of the words “No artificial flavours or colours.” This was present in Frosted Flakes, Corn Pops, and Cheerios. These breakfast cereals were associated with being neither unhealthy

nor healthy (score 41-70). Three responses talked about nutrient content claims such as “Made with whole grain gluten-free oats” present in Cheerios. This breakfast cereal was rated as healthy by these respondents (score 71-100), however it was rated as neither unhealthy nor healthy in the quantitative findings, and therefore was coded yellow in Figure 5 above. One participant talked about the nutrient content claim “100% natural whole grain wheat” present on Spoon Size Shredded Wheat. This cereal was associated with being healthy as well (score of 71-100). One participant talked about the weight of the cereal being 340g being present on the front of Frozen Frosted Cheerios. This participant rated the cereal as neither unhealthy nor healthy (score of 41-70). Two responses talked about the words “They’re magically delicious” on the front package of Lucky Charms. This cereal was associated with being an unhealthy product (score of 0-40). One participant mentioned “Wheat, no salt” as part of their response. This was referring to the front-of-package nutrition label present in Spoon Size Shredded Wheat. The front label described the cereal as containing zero grams of salt, however this participant did not provide a rating on the VAS line for the breakfast cereal. One participant mentioned that the words “Deliciously sweetened” present on the front of Golden Graham Crunch. This participant rated the cereal as neither unhealthy nor health (score of 41-70).

When comparing both quantitative and qualitative data together, it is clear that there were some similarities and some differences. For example, while marshmallows as a sub-theme was associated with being an unhealthy product present in Lucky Charms and Star Wars, quantitative data supported this as both cereals had a mean VAS score of 21.0 ± 18.6 and 22.3 ± 13.5 respectively. Both were coded as red. In comparison, the sub-theme “Made with whole grain gluten-free oats” was associated with Cheerios and rated as healthy, however quantitative data shows that this was not the case. The mean VAS score for Cheerios was 68.5 ± 22.6 which would rank the cereal as being neither unhealthy nor healthy.

Table 3. Comparison of Open-ended and Close-ended Responses. Qualitative sub-themes, breakfast cereals, healthiness rating, and participant quotes are shown below. Sugar as a sub-theme was only mentioned once by respondents for Cheerios* and Spoon Size Shredded Wheat*. Participant quotes are listed with the group number followed by participant number.

Sub-Theme (Code)	Present in Breakfast Cereal(s)	Cereal associated with being Unhealthy, Neither unhealthy nor healthy, Healthy	Number of Quotes (Open-ended Responses)	Example of Participant Quotes
Spokes-character (201.1)	Frosted Flakes	Unhealthy	1	“There’s a character on the box” (C4)
Marshmallows (201.2)	Lucky Charms, Star Wars	Unhealthy	13	<p>“The marshmallows in Lucky Charms they are not healthy” (A2)</p> <p>“Because it has marshmallows inside of it and its healthy because it’s cereal” (A3)</p> <p>“Unhealthy because on the front you can see that all the cereal is marshmallows with colour. And you can see that it says it’s made magically delicious” (A4)</p> <p>“Unhealthy: Marshmallows. Healthy: Cereal” (A7)</p> <p>“There is cereal but also marshmallows. Not healthy but 100% yummy” (B6)</p> <p>“It says it has marshmallows” (C4)</p> <p>“No! It has marshmallows” (C13)</p>

Sugar (201.3)	Lucky Charms, Star Wars, Corn Pops, Frosted Flakes, Golden Graham Crunch, Frozen Frosted Cheerios, Cheerios*, Spoon Size Shredded Wheat*	Unhealthy	24	<p>“They have oats so I think kind of healthy they also have sugar” (A2)</p> <p>“It is healthy and unhealthy because it is cheerios and it has a little bit of sugar” (A3)</p> <p>“They have no sugar” (A5)</p> <p>“Strawberries. Flakes. A little bit of sugar” (A6)</p> <p>“It looks like is has sugar on it” (B1)</p> <p>“I think it’s unhealthy because it’s like Lucky Charms and that’s sugary” (B2)</p> <p>“Because it has a lot of sugar” (C7)</p>
Grain (201.4)	Cheerios, Spoon Size Shredded Wheat, Corn Pops, Golden Graham Crunch	Healthy	10	<p>“Wheat, no salt” (A1)</p> <p>“They have oats so I think kind of healthy they also have sugar” (A2)</p> <p>“Cheerios have oats” (A2)</p> <p>“Because it is made out of wheat” (B1)</p> <p>“Because it is made out of grain” (B5)</p> <p>“It’s made out of wheat” (C8)</p>
Fruit/Vegetable (201.5)	Corn Pops, Frosted Flakes, Spoon Size Shredded Wheat	Healthy	7	<p>“Sugar and corn” (A1)</p> <p>“It is unhealthy because it has sugar in it. It is healthy because it has corn in it” (A3)</p>

				<p>“Strawberries. Flakes. A little bit of sugar” (A6)</p> <p>“Healthy: Raspberries shredded wheat” (A7)</p> <p>“Is there strawberry in it?” (D4)</p>
Honey (201.6)	Cheerios, Frozen Frosted Cheerios, Golden Graham Crunch	Neither unhealthy nor healthy	3	<p>“Because it is made out of honey” (C7)</p> <p>“Because they have honey in them” (C8)</p> <p>“Is there honey?” (D4)</p>
“No artificial flavours or colours” (202.1)	Frosted Flakes, Corn Pops, Cheerios, Golden Graham Crunch	Neither unhealthy nor healthy	5	<p>“Because it has a coating of sugar. Just like Corn Flakes, but filled with sugar. It also says no artificial flavours or colours. Yah they have a full coat of sugar! Corn Flakes are healthy” (A4)</p> <p>“It says there’s no artificial colours or artificial flavours” (C4)</p> <p>“No artificial flavours or colours” (D2)</p>
“Made with whole grain gluten-free oats” (202.2)	Cheerios	Healthy	3	<p>“It is healthy because it has whole grain and free oats inside of it” (A3)</p> <p>“Because on the front it says made with whole grain gluten free oats which sounds very healthy, but I feel they may have a bit of sugar in them” (A4)</p> <p>“Made with whole grain gluten-free oats” (D2)</p>
“100% natural whole grain wheat” (202.3)	Spoon Size Shredded Wheat	Healthy	1	<p>“Because it says 100% natural whole grain wheat. If you have mini wheats they are COVERED in sugar but they look healthy and good for you” (A4)</p>

Weight of the cereal box (340g) (202.4)	Frozen Frosted Cheerios	Neither unhealthy nor healthy	1	“Because they are frosted and I bet a lot of the frost is sugar, but then again they are Cheerios so they are a little healthy too. On the bottom it says 340 I think 340g” (A4)
“They’re magically delicious!” (202.5)	Lucky Charms	Unhealthy	2	“Unhealthy because on the front you can see that all the cereal is marshmallows with colour. And you can see that it says it’s made magically delicious” (A4) “It says delicious so it might be sugary” (B2)
Front of package nutrition label (202.6)	Spoon Size Shredded Wheat	Missing Value	1	“Wheat, no salt” (A1)
“Deliciously sweetened graham cracker flavoured cereal” (202.7)	Golden Graham Crunch	Unhealthy	1	“Because it says on the box deliciously sweetened graham which probably means that it is closer to unhealthy” (A4)

Chapter 5.0: Discussion

5.0 Discussion

Much research has been documented on spokes-characters' influence on children's diet and health in the literature including spokes-characters' effects on children's preference for food (55,65,91), purchase requests (136), and food intake (93,169). Our study looked at spokes-character advertising and children's perceived healthiness of breakfast cereals. In this study, there was four different categories of breakfast cereal advertising:

Category A: Brand Mascots

Category B: Cartoon Media Characters

Category C: No Spokes-character advertising

Category D: Healthy breakfast cereal advertising

When comparing within breakfast cereal categories, Lucky Charms and Frosted Flakes from Category A had a mean VAS score of 21.0 and 45.0 respectively, however, Lucky Charms ranked last as the breakfast cereal with the lowest mean VAS score, while Frosted Flakes ranked fifth. Similarly, Star Wars and Frozen Frosted Cheerios from Category B had a mean VAS score of 22.3 and 54.5 respectively, but Star Wars ranked the second lowest while its category counterpart Frozen Frosted Cheerios ranked higher with the third highest mean VAS score. In both Brand Mascots and Cartoon Media Characters, one breakfast cereal ranked lower compared to its category counterpart. When comparing mean VAS scores between categories, Category A scored 33.0 while Category B scored 38.4. Both brand mascots and cartoon media characters were rated as unhealthy (score of 0-40) but the mean VAS score for brand mascots scored higher compared to cartoon media characters.

When comparing between the four categories of breakfast cereals, brand mascots had a mean VAS score of 33.0 (unhealthy) and cartoon media characters had a mean VAS score of 38.4 (unhealthy). The category for no spokes-character advertising had a mean VAS score of 47.3 (neither unhealthy nor healthy) while the category for healthy breakfast cereal advertising scored 70.7 (neither unhealthy nor healthy). Additionally, when the open-ended question asked participants "What do you see on the front package that makes you think is healthy or unhealthy" one participant said "There's a character on the box" (C4).

Qualitative analysis suggests that sub-themes most mentioned from participants included content found on the front of the cereal box: 1) Images and 2) Nutrient content claims on the front package. In terms of images present on the front package, participants' responses often included marshmallows or sugar for their justification in rating their cereal as unhealthy. Only one participant made mention of the spokes-character on the front package and rated Frosted Flakes cereal as unhealthy, corresponding to a score of 17. Some participants believed that there were fruits/vegetables present in the cereal based on the images/text they saw on the front package i.e. in Frosted Flakes and Corn Pops.

In terms of text present on the front package, participants believed certain breakfast cereals were healthy because of the words "No artificial flavours or colours" present on the front package. While not all breakfast cereals indicated that sugar was added, participants identified the words "frosted" as being associated with sugar. Some participants thought that Frozen Frosted Cheerios contained wheat or oats and believed it to be healthy. These same participants were asked to rate Cheerios cereal earlier on in the questionnaire and may have misunderstood Cheerios and Frozen Frosted Cheerios as being the same type of cereal. For example, the words "Made with whole grain gluten free oats" were present on the Cheerios cereal box but was not present on the Frozen Frosted cereal box. Literalism in text and images were present in children's responses for this study, similar to that found in previous research (51). Literalism is defined as "strict interpretation of a word or image (without accounting for metaphor or exaggeration)" (51). Children in one study interpreted text on the front package literally and commented that Life[®] cereal was the healthiest cereal "Usually if they're talking, Life[®] is good for you because they're actually worried about your health" (51). Similarly, children in our study believed that strawberries on the front package of the cereal would be present in the actual cereal and evaluated the cereal as healthy. Some children also thought that Corn Pops cereal was made from corn and perceived the cereal as being healthy.

Qualitative data collected supports quantitative findings. For example, themes such as marshmallows and sugar are associated with Lucky Charms cereal and Star Wars cereal. These two cereals had a mean VAS score rating of 21.0 and 22.3 respectively, which corresponds to a healthiness rating of unhealthy (0-40). Themes relating to grain either identified as an image on the front box or as a nutrient content claim, was associated with Spoon Size Shredded Wheat, Cheerios, and Corn Pops cereal. These breakfast cereals had a mean VAS score rating of 72.9,

68.5, 44.38 corresponding to a rating of healthy (71-100), neither unhealthy nor healthy (41-70), and neither unhealthy nor healthy (41-70) respectively.

Our research findings are consistent with other findings in the literature. Elliott and Brierley found that *Lucky the Leprechaun*TM, and *Toucan Sam*TM, were interpreted as representing an unhealthy food product (51). In our current study, *Lucky the Leprechaun*TM was present on Lucky Charms cereal and was also rated the least healthy compared to other cereals. Elliott and Brierley's study demonstrated that children are inherently aware that spokes-characters are associated with unhealthy food products (51). For instance, children commented that "Elmo isn't healthy...he's all scruffy" (51). Children also mentioned that "Dora is not healthy and everybody laughed because we're thinking of the cartoon person on the candy. It's gummy worms or gummy bears..." (51). This shows that children associated spokes-characters with food products that are calorie dense and low in nutrients such as sugar or in our case, marshmallows present in Lucky Charms cereal. Children at this age and those from our study seem to have some awareness of food companies' attempt to advertise a product to them using spokes-characters. They have a general understanding that spokes-characters are often tied to sugary foods that may not be good for one's health or diet. Findings from our pairwise comparisons support this as Lucky Charms and Star Wars cereal were consistently ranked lower than their pairwise counterparts.

In another study conducted by Lapierre et al., participants viewed one of four professionally created cereal boxes and asked to rate the taste of the cereal (55). Children rated the cereal as tasting better when they were told the cereal was named Healthy Bits versus children who were told the cereal was named Sugar Bits (55). This is significant as these results were comparable to our current study where text on the front package seemed to have influenced our participants to rate certain cereals as healthier. Cheerios and Spoon Size Shredded Wheat were ranked highest among the eight cereals. This may have been due to the fact that the words "Made with whole grain gluten free oats" and "100% natural whole grain wheat" were present on the front package.

Some of the data collected inspired consideration of the "halo effect theory", in particular the "health halo effect" (170). The health halo effect occurs when a claim about a single healthy quality on the front package increases a positive perception for other non-claimed qualities (170). Some responses from our study demonstrate this. For example, one participant mentioned

“Strawberries. Flakes. A little bit of sugar” (A6) when asked what they thought on the front package of Frosted Flakes made them think the cereal was healthy or unhealthy. This participant also rated Frosted Flakes as being healthy (score of 71-100). It is possible that some of our participants experienced the health halo effect and rated certain breakfast cereals as being healthier than they would have if fruit/vegetables were not present on the front package. Other studies from the literature have cited similar findings as described below.

A randomized control trial conducted by Harris et al., examined the effects of messages promoting nutrient-poor foods when advertising to children seven to eleven years old (171). Children were randomized into three conditions each viewing a different commercial. In the first condition, children were exposed to health halo commercials which included commercials with a message promoting nutrition (i.e. images of fruit) and physical activity (i.e. active children on the playground)(171). In the second condition, children viewed commercials that used humour and fun, which were unrelated to health (171). In the third condition, children viewed commercials for products that were categorized as healthy (171). Children who viewed the health halo commercials in condition one, rated the food products seen in those commercials as significantly healthier than did children who saw the commercials in the second and third conditions (171).

In another similar study conducted by Sutterlin and Siegrist, the authors found that in a series of four different experiments, simply adding the word “fruit” on the food package influenced consumers to view the product as being healthier than it was (172). When the phrase “fruit sugar” was listed as an ingredient instead of “sugar,” participants had a positive perception of the cereal’s healthiness (172). This is further supported by a study conducted by Fernan, Schuldt, and Niederdeppe, where protein claims on the front package not only increased the perceived amount of protein present in the product, but also increased perceptions of other non-claimed nutrients (173).

Findings from these studies suggests that when food companies use health messages as part of their marketing techniques to children, it may cause confusion, and a misleading perception that a food’s nutrient content is higher than it actually is, especially when health messages (i.e. physical activity) are paired with foods with a low nutrient content (174). Findings also show that one healthy quality that is promoted to the attention of the consumer, is able to influence the consumer to generalize the entire food product as being healthy, when this may not entirely be true. In the current study, when asked if participants saw anything on the front

package that made them perceive the breakfast cereal as healthy or unhealthy, some responses included berries or corn they saw on the front package. For example, one participant said “It is unhealthy because it has sugar in it. It is healthy because it has corn in it” (A3), but they did not rate the cereal as being healthy. Instead, it was rated as being neither unhealthy nor healthy (score of 41-70). It is possible that participants were experiencing the health halo effect, and thought that corn was healthy while sugar was unhealthy, thereby rating the overall product as being neither unhealthy nor healthy.

5.1 Limitations of the Study

There were a few limitations to this study. Our desired sample size was 45 participants based on a calculated power analysis, but only 34 participants were recruited. As data collection spanned from January to May 2018 and September to October 2018 and as a result of time constraints, recruitment ended with 34 participants, however another student may continue this project if there is enough interest. Due to limitations mentioned below, our research results are not generalizable to the greater population.

Another limitation was related to the data collection tool. Due to the written nature, oral comments and responses were not able to be captured. For example, some participants discussed out loud their reasoning for why they thought a particular breakfast cereal was unhealthy but did not proceed to write their answer in the FMBC questionnaire. This limited the amount of qualitative data captured during the study visits. If this study were to be repeated in the future, focus group methodologies could be applied. This would include audio recording and transcription of the data. Focus groups are viewed as a valued method for eliciting children’s perspectives and ideas on topics that would not be possible using a tool such as the VAS (175). For instance, if a focus group was conducted, direct questions could have been asked to children on what they perceived as a healthy or unhealthy product. Probing and clarification of responses could also be used (175). Previous studies conducted with children and front-of-package foods have applied qualitative methods using focus groups in data collection (47,51). However, there is a drawback as these researchers were not able to quantify how healthy a product was unlike our current study, in which the VAS was used. An alternative method could be to audio record children speaking in the room in addition to administering the FMBC questionnaire. This would ensure that the audio recordings could be used as field notes in addition to the qualitative data collected on the questionnaire.

The large variance in English literacy skills of our participants were evident by the data collected on part B of each question on the FMBC questionnaire. Some participants provided no answer, a single word to represent their answer, or a paragraph describing their opinion and answer. For the most part, our participants (aged seven to eight years old) struggled with the second portion of each question which asked “What do you see on the front package that makes you think the cereal is healthy or unhealthy?” Participants’ low literacy skills could have prevented them from writing down an answer to part B of the questionnaire. It is possible that they could have denied our requests for assistance with spelling and grammar in an attempt to prevent themselves from feeling embarrassed (176).

Dividers were set in place to prevent possible sharing of ideas if participants decided to look at their peers’ answers on their questionnaire. This was effective in preventing sharing of answers visually but did not prevent participants from speaking out loud, which may have introduced bias as other participants were able to hear over the dividers.

5.2 Conclusion

This study showed that children used images and nutrient content claims on the front package to evaluate the healthiness of breakfast cereals, similar to findings in the literature (47,51). It is possible that other non-spokes-character related images and text on the front package may have impacted children’s perceived healthiness of breakfast cereals more than that of spokes-characters (See Table 2 above for theme codebook). Qualitative data showed that one participant mentioned spokes-characters as influencing their perceived healthiness for a breakfast cereal, and rated the cereal containing the spokes-character on the front as unhealthy. Nevertheless, we cannot rule out the possibility that spokes-characters did affect children’s perceived healthiness of breakfast cereals. Quantitative data demonstrated that breakfast cereal Categories A (Brand Mascots) and B (Cartoon Media Characters) were ranked lower in terms of healthiness scores compared to both Category C (No Spokes-character Advertising) and D (Health Breakfast Cereal Advertising). Future research on spokes-character advertising on the front package should consider using a pilot project with children to conduct face validity on the questionnaire. This will help determine if children understand the questions being asked. Additionally, the use of focus groups in addition to the FMBC questionnaire could be an alternative method. Asking children directly if they think spokes-characters on the front package are associated with a healthy or unhealthy product would provide a clearer answer.

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Appendix A: University Research Ethics Board (UREB) Clearance Certificate

University Research Ethics Board

Certificate of Research Ethics Clearance

Effective Date	May 12, 2017	Expiry Date	May 11, 2018
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File #:	2016-162
Title of project:	<i>Influence of Spokes-character marketing on children's perceived healthiness of breakfast cereals</i>
Researcher(s):	Shannan Grant
Supervisor (if applicable):	n/a
Co-Investigators:	Gillian Chu; Michelle Eskritt; Laurie Wadsworth; Teri Emrich
Version :	1

The University Research Ethics Board (UREB) has reviewed the above named research proposal and confirms that it respects the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and Mount Saint Vincent University's policies, procedures and guidelines regarding the ethics of research involving human participants. This certificate of research ethics clearance is valid for a period of **one year** from the date of issue.

Researchers are reminded of the following requirements:	
Changes to Protocol	Any changes to approved protocol must be reviewed <u>and</u> approved by the UREB prior to their implementation. Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003
Changes to Research Personnel	Any changes to approved persons with access to research data must be reported to the UREB immediately. Form: REB.FORM.002 Info: REB.SOP.113 Policy: REB.POL.003
Annual Renewal	Annual renewals are contingent upon an annual report submitted to the UREB prior to the expiry date as listed above. You may renew up to four times, at which point the file must be closed and a new application submitted for review. Form: REB.FORM.003 Info: REB.SOP.116 Policy: REB.POL.003
Final Report	A final report is due on or before the expiry date. Form: REB.FORM.004 Info: REB.SOP.116 Policy: REB.POL.003
Unanticipated Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within seven (7) working days of the event. Form: REB.FORM.008 Info: REB.SOP.115 Policy: REB.POL.003
Adverse Research Event	Researchers must inform the UREB immediately and submit a report to the UREB within two (2) working days of the event. Form: REB.FORM.007 Info: REB.SOP.114 Policy: REB.POL.003

*For more information: <http://www.msvu.ca/en/home/research/researchethics/policies/default.aspx>

Dr. Daniel Séguin, Chair
University Research Ethics Board



Appendix B: Parental Consent Form

Parent and/or Guardian Consent Form

Full Study Title: Influence of Spokes-character marketing on children's perceived healthiness of breakfast cereals in Halifax, Nova Scotia

Short Study Title: SCM

Principal Investigator: **Dr. Shannan Grant, Pdt, MSc, PhD**

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Introduction

Your child has been invited to take part in a research study. A research study is a way of answering a question about something that is not well understood. Your child is being approached as a potential study participant because she is between seven and eight years of age. Children of this age group tend to be exposed to a large amount of food marketing and advertising, and we are interested in studying how this can affect children's perceptions of the foods they eat. Taking part in this study is voluntary. It is up to you and your child to decide whether to be in the study or not. This consent form explains the study. Before you decide, please take time to make sure you understand what you will be asked to do, what risks you might take and what benefits you might receive. If you decide that your child would like to take part in this study, please sign and date the form on the last page and return it to your child's Brownie leader.

The Study Coordinator will be available to discuss the study and make sure all of your questions are answered before you decide whether or not you want your child to participate in this research study.

Study Purpose

Food marketing and advertisements aimed at children have been shown to affect children's eating habits. This includes the types of food children choose to eat as well as their food preferences for less healthy foods. Research shows that the most common food categories advertised to children are sugar-sweetened breakfast cereals, soft drinks, savoury snacks, candies and chocolate, as well as fast foods. Majority of these foods are high in sugar, salt, and fat. In many of these food advertisements, cartoon characters such as *SpongeBob Squarepants*TM, and *Chester the Cheetah*®, are commonly used in advertising the food product. In this study, we would like to find out how advertisements affect children's perceptions of breakfast cereals.

Recruitment

Your child will be one of 41 participants (children, girls) we aim to include in this study. Children in this study will include Brownies between the ages of seven to eight years of age from the three units within the Girl Guides of Canada Harbourside Area. After you have provided consent on the last page of this form, please ask your child to bring this form in addition to your child's "Information for Children" form back to their unit leaders at their regular Girl Guide meeting.

Description of Study

At the beginning of your child's Brownie meeting, the Study Coordinator and research assistant will introduce themselves to the Brownie unit. General details about the study will be provided, including how long each child will have to stay in the study for, what the study procedures are, and what will be required of them. There will be 10 to 15 minutes of time set aside between the introduction and the study to allow for any questions that Brownies may have prior to starting the study. When your child enters the room, they will be asked to take a seat along a table that will be sectioned off by Bristol board dividers similar to voting stations (See Figure 1. on next page).

The dividers (Item number one) will ensure that children are not sharing opinions or answers with each other. The seat will have a Food Marketing and Breakfast Cereal (FMBC) questionnaire (Item number two) for your child to complete. Once seated in the room, the Study Coordinator and research assistant will show your child a total of eight breakfast cereal boxes with the front of the package cut out. This will be passed around the room. Your child will be asked to complete the FMBC questionnaire using a visual analogue scale (VAS)(Item number three). Each child will be asked to use the VAS line to rate how healthy they think each of the eight cereal boxes are one at a time.

Figure 1. Study set-up. This is an example of the anticipated research study set-up. Item number one is the dividers. Item number two is the VAS scale on a dry erase board. Item number three is the FMBC questionnaire.

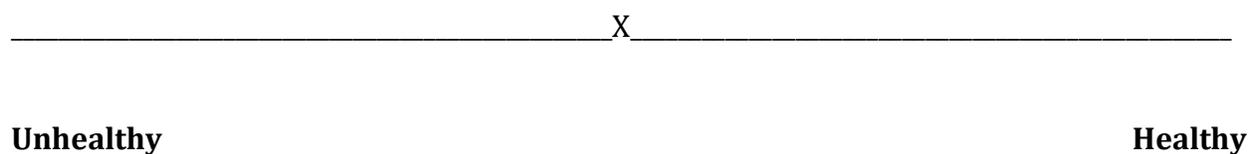


Visual Analogue Scale (VAS)

The VAS is an abbreviation for visual analogue scale. The VAS has been used in many research and clinical settings, most often used for pain measurement in children. Typically, a child will be asked to place a vertical mark anywhere along the 100mm line to specify how much pain they feel. Calculation of pain intensity scores can be done by measuring the distance from the left end point to the child's vertical mark along the scale. In this study, we have modified the VAS to measure how healthy children perceive breakfast cereals to be (See Figure 2. below). In this study, your child will be asked to rate how healthy they think a breakfast cereal is by placing a "X" anywhere along this line. The Study Coordinator will provide a live demonstration at the front of the room on how to use the VAS line.

Figure 2. Visual Analogue Scale (VAS). This is an example of a VAS question from the FMBC Questionnaire. The research assistant will show participants eight different cereal boxes and participants will be asked to fill out eight of these questions during the study session.

Question 1. How healthy is Cereal A?



Possible Risk Factors

As mentioned before, young children may find greater difficulty in understanding the VAS because it requires more time and instruction to teach. In order to diminish potential psychological risks, the Study Coordinator will speak with your child at the beginning of the session and come around to answer any questions that your child may have. Your child will be informed that if they do not feel comfortable at any time while completing the questionnaire, they have the right to leave the study without further consequences.

If my Child Chooses to Leave the Study

Your child can choose to end their participation at any time. If your child chooses to leave the study by providing notice to the research team, your decision will have no negative consequences. Your child will be informed at the beginning of the research study that if they do not feel comfortable at any time, they should raise their hand and the Study Coordinator or research assistant will walk with them out of the study room and lead them back onto the guiding floor.

If data has already been collected (i.e. if your child has already filled out part or all of the FMBC questionnaire), it will be marked as incomplete by the Study Coordinator and will be kept safely for future use by the research team. There will be no negative repercussions from withdrawing at any point before or during the research study. If your child chooses to leave the study, you will be contacted by the Study Coordinator to discuss your child's reason for leaving.

Benefits of Participating in This Study

Your child may not benefit directly from participating in this study. Brownie participants may gain new scientific insight and health literacy skills using the VAS through completion of the breakfast cereal questionnaire. Their participation in this study will inform growing knowledge on this topic and potentially improve public awareness of food marketing practices that target children.

Study Completion

At the end of the study period, your child will have the opportunity to obtain a special interest badge in nutrition. All Brownies will be provided this opportunity regardless if they choose to participate in the study or not. The Study Coordinator will attend a weekly Brownie meeting to offer a nutrition presentation to the Brownies unit. Activities will involve learning how to interpret the Canadian Food Guide as well as how to read nutrition labels.

Cost of Participating in the Study

While your child will not be compensated for their participation, it will not cost you any out-of-pocket expenses either as your child will already be attending their weekly Girl Guide meeting.

Privacy and Confidentiality

Protecting your and your child's privacy is an important part of this study and every effort will be made to do so. Complete privacy cannot be guaranteed. For example, the Study Coordinator may be required by law to allow access to research records.

Participants will not be anonymous to the Study Coordinator or research assistant, however the responses from the questionnaires will be kept confidential and will not be linked to participants. Personal names of participants will not be used for the questionnaire, thus responses collected will not be identifiable to a specific participant. A cardboard box with a small opening will be created and placed in the front of the room in order to store hard copies of the completed questionnaires that will be collected during each study visit. Participants will be able to drop off their completed questionnaire into the box at the end of their study session. This provides increased anonymity, especially during transport of data from the study site to the thesis supervisor's office. This process of transportation will be used for each study visit until the end of the study period.

All consent and assent forms as well as questionnaires will be stored in a locked filing cabinet inside the thesis supervisor's office. Consent and assent forms will be kept separate from the anonymous questionnaires to prevent possible identification of participants. After the study period ends, consent forms, assent forms, and questionnaires will be scanned and converted into electronic data. All hard copies of the data will be shredded onsite at MSVU. All electronic data will be stored on a database (student H drive) on the MSVU campus computers. Any data that will be analyzed on the MSVU campus computers will be anonymous and no personal health information will be identified.

Your child's responses will not be shared with others without your permission. Your child will not be audio recorded or video recorded in any way or form. The Study Coordinator will use the information collected about your child's responses during the study only for



scientific research purposes. If the results of this study are presented to the public, nobody will be able to tell that your child was in the study.

The research team and the other people listed above will keep the information they see or receive about your child confidential, to the extent permitted by applicable laws. Even though the risk of identifying your child from the study data is very small, it can never be completely eliminated.

Perceived Conflict of Interest

The Study Coordinator (Gillian Chu) is a Masters student at Mount Saint Vincent University (MSVU). The current study is being conducted as part of Gillian's Master's degree (MSc) requirements, which may be perceived as a conflict of interest.

Study Contact Information

For further information about the study you may call the Study Coordinator or the principal investigator. Their contact information is listed below.

The Study Coordinator is Gillian Chu

Telephone: (902) 457-5400

Email: gillian.chu@msvu.ca

The Principal Investigator is Dr. Shannan Grant.

Telephone: (902) 457-5400

Email: shannan.grant2@msvu.ca

My Child's Rights as a Participant

You and your child have the right to all information that could help you make a decision about participating in this study. You and your child also have the right to ask questions about this study and your rights as a research participant, and to have them answered to



your satisfaction before you make any decision. You and your child also have the right to ask questions and to receive answers throughout this study. You and your child have the right to withdraw your consent at any time.

If you have any questions about your child's rights as a research participant, contact Brenda Gagné at (902) 457-6788 or brenda.gagne@msvu.ca.

In the next part you will be asked if you agree (consent) to let your child join this study. If the answer is "yes", please sign the form.



Consent Form Signature Page

I have reviewed all of the information in this consent form related to the study called:
*Influence of Spokes-character marketing on Children's Perceived Healthiness of
Breakfast Cereals*

I have been given the opportunity to discuss this study. All of my questions have been answered to my satisfaction. This signature on this consent form means that I agree to allow my child to take part in this study. I understand that I am free to withdraw my permission at any time without negative consequences.

I **agree** to allow my child to participate in this study as described in this consent form.

Signature of Parent and/or
Guardian

Name (Printed)

___ / ___ / ___
Year Month Day

Signature of Study
Coordinator

Name (Printed)

___ / ___ / ___
Year Month Day

Signature of Witness

Name (Printed)

___ / ___ / ___
Year Month Day



Appendix C: Child Assent Form
Information for Children

Full Study Title: Influence of spokes-character marketing on children's perceived healthiness of breakfast cereals in Halifax, Nova Scotia

Short Study Title: SCM

Principal Investigator: Dr. Shannan Grant, PDt, MSc, PhD; available 9am to 5pm Mon-Fri
Assistant Professor, Department of Applied Human Nutrition,
Mount Saint Vincent University
Office Telephone: (902) 457-5400
Email: Shannan.Grant2@msvu.ca

Co-investigators: Dr. Michelle Eskritt, MA, PhD; available 9am to 5pm Mon-Fri
Assistant Professor, Department of Applied Human Nutrition,
Mount Saint Vincent University
Phone: (902) 457-6593
E-Mail: michelle.eskritt@msvu.ca

Gillian Chu, MSc Student; available 9am to 5pm Mon-Fri
Research Coordinator
Department of Applied Human Nutrition, Mount Saint Vincent University
Office Telephone: (902) 457-5400
Email: gillian.chu@msvu.ca

Roberta Jackson, BSc Student
Research Assistant
Department of Applied Human Nutrition, Mount Saint Vincent University

Introduction

This study aims to measure your opinion on how healthy or unhealthy you think breakfast cereals are. This form will tell you about our study and what happens during the study. If there is anything in this form you do not understand, please ask your caregiver(s) or contact the study coordinator for any questions you may have.

Reason for conducting this study.

You were asked to be in this study because children aged seven to eight years old are exposed to a large number of food advertisements, especially from television. In this study, the research coordinator and her assistant would like to find out how advertisements affect your perceptions of breakfast cereals.

Number of children in the study

We hope that 41 kids will be in this study. If you choose to participate in this study (with caregiver support), you will be a participant. A person who joins a study is called a participant. Everyone who joins the study will be from the Girl Guides of Canada Harbourside Brownie unit.

Description of study

If you choose to be in this study you will participate in a study session once between April 24, 2017 to May 19, 2017.

During the study:

- You will be asked to sit at a table with three other girls.
- The research coordinator will give a PowerPoint presentation at the front of the room about children's breakfast cereals.

- The research coordinator will ask you questions about different types of children's breakfast cereals using a questionnaire, in which you will record your answers using pen and paper.
- The research coordinator and research assistant will come to your desk and show you eight different types of cereals.
- You will be asked to rate how healthy you think each cereal is on a sheet of paper.
- Your participation in this study will be 30 minutes long and you will only need to participate once.

Privacy and confidentiality

Other girls in your Brownies unit will know that you are participating in the study. Any information that you give us will be kept private, but there are people who can look at the information either to make sure that the study is being done properly or for your safety.

Your name will not be on any study papers.

Your right as a participant

You do not have to be in this study. It is up to you. You do not have to decide today. You can take time to think about it and talk to your parents. Even if you say yes now, you can change your mind later. If you take part, you can stop at any time you want. If you change your mind during the study and leave, the answers you have provided on the questionnaire will be kept in a safe and secure place.



For questions or more information

The study coordinator is Gillian Chu. If you have any questions or concerns about the study, she can be reached at (902) 457-5400. Her email is gillian.chu@msvu.ca.

Put an "X" on the line below if you talked with your caregiver(s) about being in this study.

_____ I talked with my caregiver(s) about joining the study.



Do you want to be in this study?

You need to decide whether or not you want to be in this study. Talk with your caregiver(s) or contact the research coordinator. Ask any questions you may have.

If you want to be in this study, please write your name and the date.

Name: _____

Date: _____

Day/Month/Year

Parent/Legal Guardian: Please print and sign your name and date to indicate that this study was explained to your child.

Printed Name: _____

Signature: _____

Date: _____

Day/Month/Year

Personnel who administered the assent: Please print, sign your name, and date if you have explained this study including the associated risks, and ensured that all questions were addressed.

Printed Name: _____

Signature: _____

Date: _____

Day/Month/Year



Witness Printed Name: _____

Signature: _____

Date: _____

Day/Month/Year

Appendix D: Research Study Setup

Figure 1. a, b, c, d) The next four images illustrate the set-up of the anticipated study station. There will be a total of four chairs and three dividers. Due to limited workspace during photography, the pictures only depict three chairs and two dividers. The study coordinator will use the whiteboard at the front of the room and demonstrate to participants how to fill out the FMBC questionnaire using the VAS. A diagram has been drawn on the whiteboard as an example.



Figure 1. a) Close-up view of the study set-up

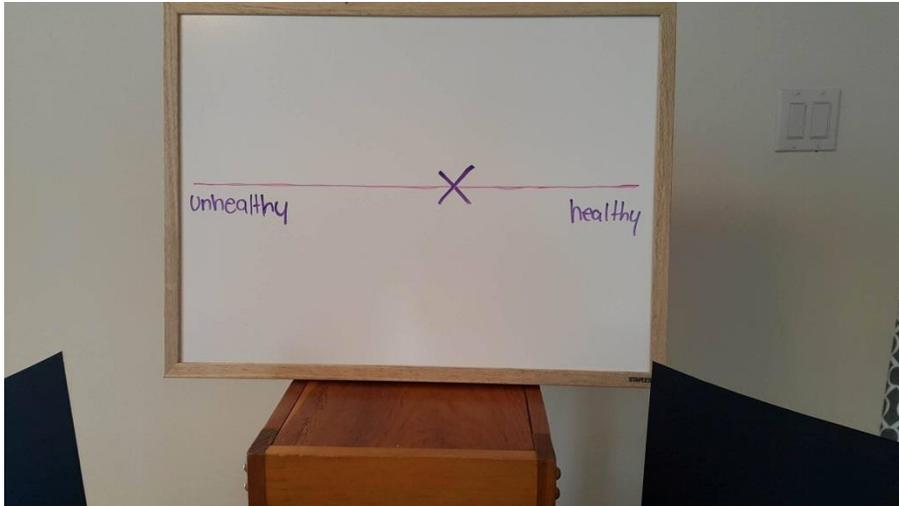


Figure 1. b) VAS questionnaire whiteboard

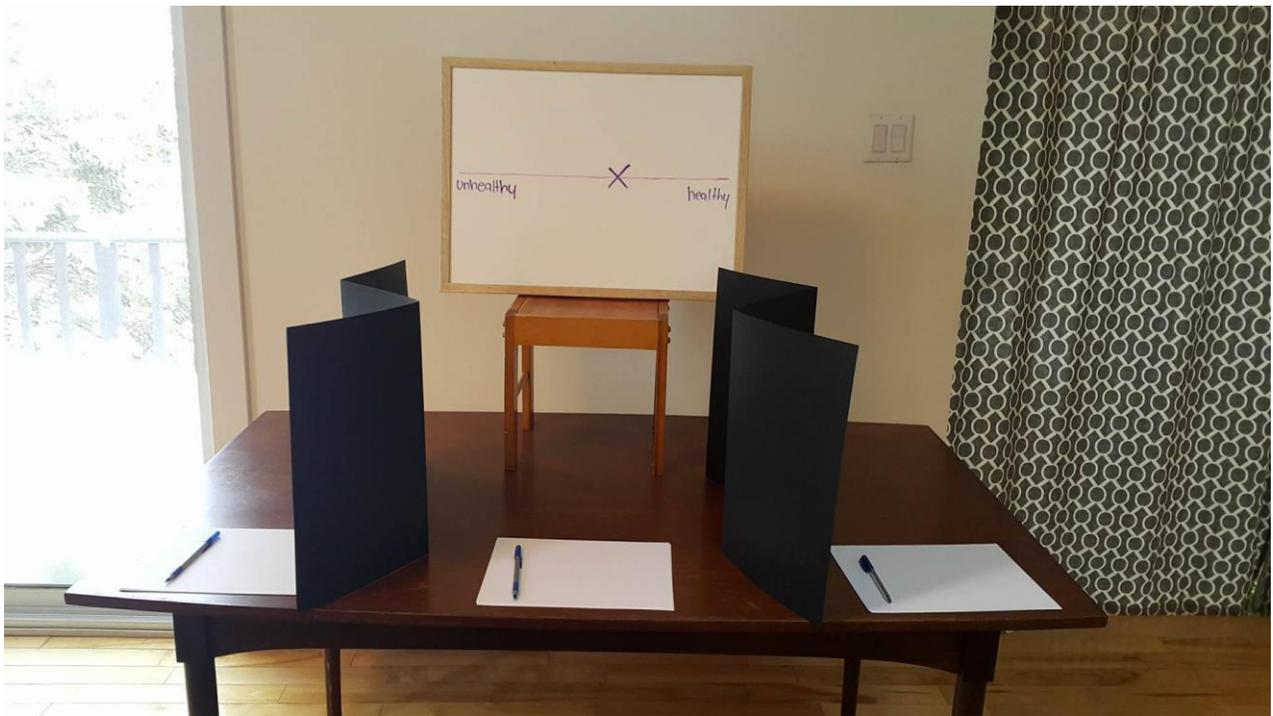


Figure 1. c) Back view of study set-up



Figure 1. d) Side view of study set-up



Figure 2. a) Lucky Charms Cereal Box



Figure 2. b) Frosted Flakes Cereal Box

Figure 2. a, b) The study coordinator is holding up examples of children’s breakfast cereal boxes at the front of the study room. The front of the cereal boxes has been cut out from the rest of the cereal box package.



Figure 3. a) Frozen Frosted Cheerios Cereal Box

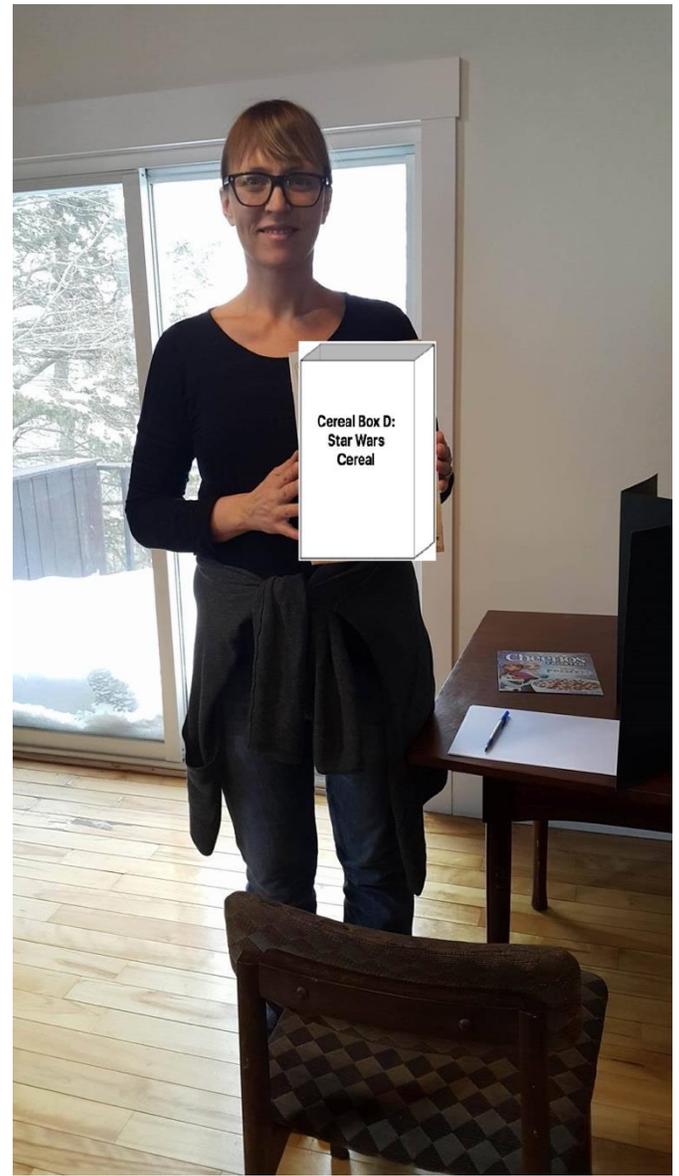


Figure 3. b) Star Wars Cereal Box

Figure 3. a, b) The research assistant is holding up examples of children's breakfast cereal boxes at the front of the study room. She will assist the study coordinator by walking to each participant at the front of the table and showing them the cereal boxes one at a time for a total of eight different cereal boxes.

Appendix E: Food Marketing and Breakfast Cereal (FMBC) Questionnaire

Food Marketing and Breakfast Cereal (FMBC) Questionnaire

Instructions: The study coordinator and the research assistant will be showing you 8 different cereal boxes and will ask you to rate each one. Please place a "X" along the line below.

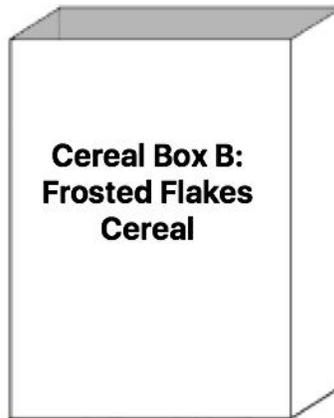
Question 1a). How healthy is Lucky Charms Cereal?



Unhealthy _____ Healthy

Question 1.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

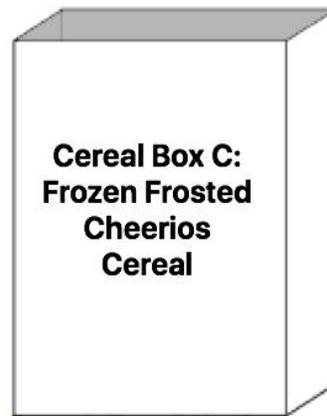
Question 2a). How healthy is Frosted Flakes Cereal?



Unhealthy _____ Healthy

Question 2.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

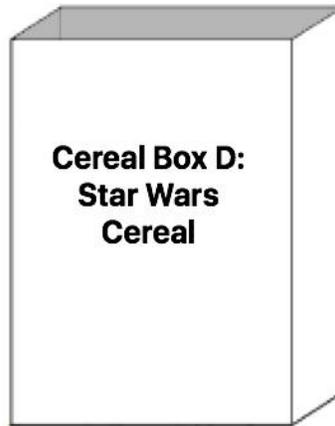
Question 3a). How healthy is Frozen Frosted Cheerios Cereal?



Unhealthy _____ Healthy

Question 3.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

Question 4a). How healthy is Star Wars Cereal?



Unhealthy _____ Healthy

Question 4.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

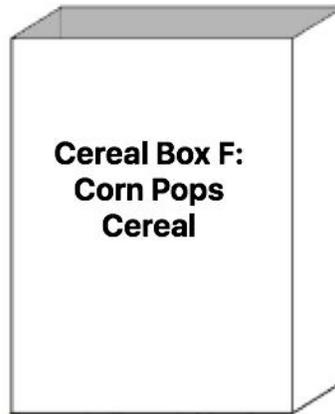
Question 5a). How healthy is Golden Graham Crunch Cereal?



Unhealthy _____ Healthy

Question 5.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

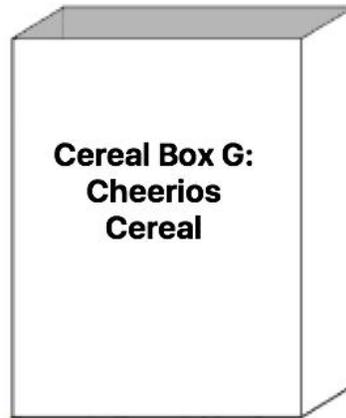
Question 6a). How healthy is Corn Pops Cereal?



Unhealthy _____ Healthy

Question 6.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

Question 7a). How healthy is Cheerios Cereal?



Unhealthy _____ Healthy

Question 7.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

Question 8a). How healthy is Spoon Size Shredded Wheat Cereal?

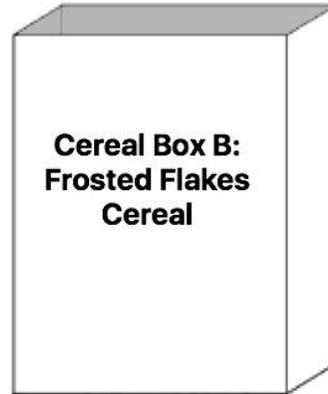
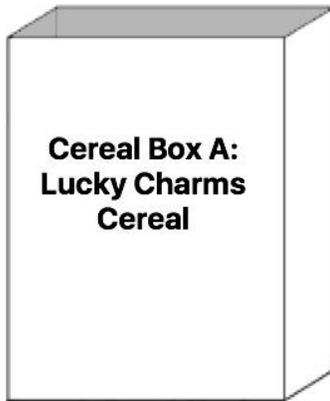


Unhealthy _____ Healthy

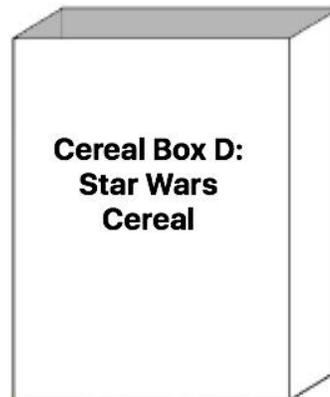
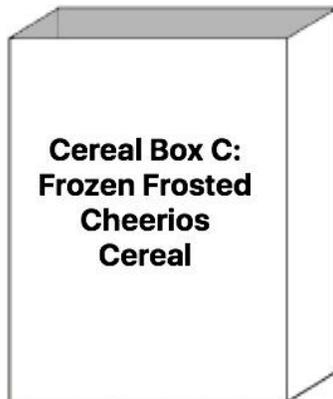
Question 8.b) What do you see on the front package that makes you think the cereal is healthy or unhealthy? Write your answer below.

Appendix F: Breakfast Cereal Images

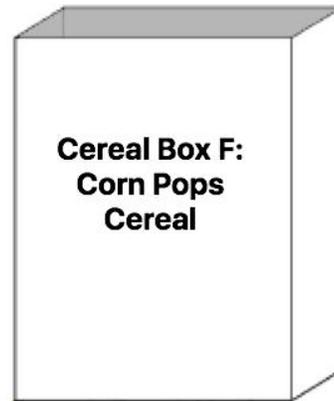
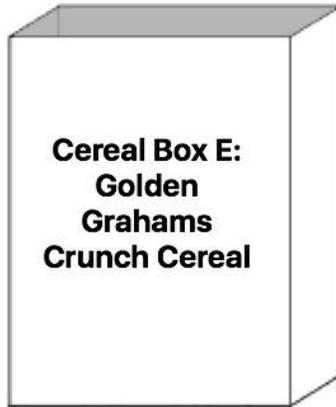
Category A: Brand Mascots



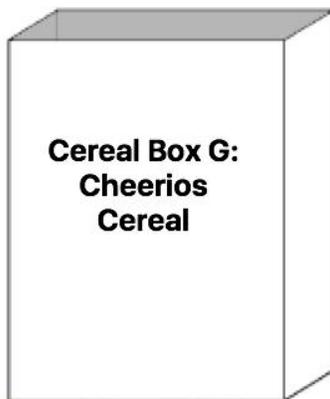
Category B: Cartoon Media Characters



Category C: No Spokes-character Advertising



Category D: Healthy Breakfast Cereal Advertising



Appendix G: Brownies Assistance Protocol (BAP)

<p>Step One: Identifying participant needs</p>	<ul style="list-style-type: none"> ● Inform participants that assistance with spelling will be provided upon raising their hands and that the research team will not ask if participants need help unless their hands are raised
<p>Participants requiring minimal assistance with questionnaire</p>	<ul style="list-style-type: none"> ● Participants who ask for assistance with spelling specific words ● Participants asking about the format of the second question i.e. can I write a word or a full sentence?
<p>Participants requiring extensive assistance with questionnaire</p>	<ul style="list-style-type: none"> ● Questions relating to the contents of the cereal box i.e. Is there sugar in the cereal? Is there wheat or oats in the cereal? Are whole grains good for you? Are there fruits that come with the cereal? ● Questions relating to definitions of the words or texts they see on the front package i.e. what does no artificial colours or flavours mean? What does gluten-free mean?
<p>Re-direct participants back to the original question</p>	<ul style="list-style-type: none"> ● In questions requiring extensive assistance, the research team will redirect participants back to the original question: Is there anything on the front package that makes you think the cereal is healthy or unhealthy? ● Acceptable responses to questions requiring extensive assistance include: <ul style="list-style-type: none"> ○ The question is not asking if there is sugar or whole grains in the cereal, it is asking you if you see anything on the front package that makes you think the cereal is healthy or unhealthy. Is there anything you see on this package that will make you think it is healthy or unhealthy? ○ We cannot answer that question because we want to know what you think based on what you see here on the front package ● If participants require a definition for certain words or images shown on the front package of the cereal box i.e. gluten-free or natural whole grain wheat, acceptable responses include: <ul style="list-style-type: none"> ○ We cannot answer that question, please try your best to answer the question using what you know and what you see on the front

	<ul style="list-style-type: none"> package <ul style="list-style-type: none"> ○ If you think certain words or symbols such as gluten-free or the whole grain symbol makes the cereal healthy or unhealthy please write that in your answer ● Acceptable responses to spelling: <ul style="list-style-type: none"> ○ Confirming spelling with participants ○ Spelling the requested word for participants
<p>Step Two: Marking questionnaires</p>	<ul style="list-style-type: none"> ● Green dots will be placed on questionnaires to identify that the research team has assisted the Brownies with spelling ● Red dots will be placed on questionnaires to identify that the research team has greatly assisted the Brownies in answering questions, engaging in conversation, and providing spelling assistance