The Impact of Cartoon Characters and Front-of-Package (FOP) Nutrition Information on Parental Perceptions of Children's Food Products

by

Wiworn Sae Yang

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

ABSTRACT

Childhood obesity is a major public health issue. Canada has one of the highest childhood obesity rates in the world. Food advertising and marketing have contributed to the rapid rise in childhood obesity. High energy and low nutrient foods have been promoted directly to children through attractive imagery on packages, including the use of popular cartoon characters. Children's food packaging also features a range of nutrition information targeted at parents, including nutrition claims; however, there is relatively little research on the impact of these nutrition claims and the extent to which they may interact with child-friendly imagery to influence parents' perception of food quality. The current study used a 2 x 2 experimental design to examine the effect of four front-of-package (FOP) nutrition information and four cartoon characters on parental perceptions of children's food products. Participants consisted of 897 parents recruited across Canada through GMI, a market research company. Participants were over 18, had at least one child between ages 4-10 and the primary shopper of their household. Participants completed an online survey in July 2011. Participants were shown images of food products with or without cartoon characters and with or without FOP nutrition information and were asked to rate the food product on appeal, nutritional quality, intention to buy and willingness to pay. Participants were also asked to rate the FOP nutrition information on believability, ease of understanding and perceived effectiveness. Linear mixed modelling examined the influence of cartoon characters, FOP nutrition information and socio-demographic factors on these outcomes. Results indicated that cartoon characters increased product appeal and FOP nutrition information increased the perceived nutritional quality of food products with low nutritional value. No significant differences were observed for intention to buy or willingness to pay. There was no consistent pattern between socio-demographic factors and product rating outcomes. For FOP nutrition information ratings, *Health Check* and *Source of Fibre* were rated more believable, easier to understand and more effective overall than *Sensible Solution* and *Given the Thumbs Up by Kids*. Overall, the findings indicate that cartoon characters can increase the perceived appeal and FOP nutrition information can increase the perceived nutritional quality of food products with low nutritional value.

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1.0 INTRODUCTION

Childhood obesity is increasing at an alarming rate worldwide (World Health Organization, 2010). This is a major public health issue because not only does it contribute to early development of many chronic diseases (Public Health Agency of Canada, 2010; Dietz, 1998), but it also causes social and psychological harms (Puhl & Latner, 2007; Dietz, 1998). Currently, there is no single solution that will ameliorate the childhood obesity problem; therefore, multiple approaches that focus on prevention should be considered (Dietitians of Canada, 2010).

The food industry has been implicated in the childhood obesity problem (Harris, Pomeranz, Lobstein, & Brownell, 2009; Institute of Medicine, 2006). Food marketing encourages children to eat foods high in energy and low in nutrients (Harris et al., 2009; Institute of Medicine, 2006). Furthermore, food advertisements have been shown to influence children's food knowledge, preferences and behaviours (Dietitians of Canada, 2010; Hastings et al., 2003). Children still lack the cognitive skills to defend themselves against persuasive advertising messages (Valkenburg, 2000), which means they need greater protection from advertisements. Although food marketing is only one of the myriad factors, it has a significant impact on childhood obesity given its influence over a large population of children. Thus, regulation of food marketing practices directed at children should be one of the top priorities to help curb the rising childhood obesity rates.

Packaging has become an important marketing tool in the food industry (Rettie & Brewer, 2000). Marketers use various methods, including cartoon characters, and use of colours, sizes and shapes to attract children's attention (Hawkes, 2010; Elliott, 2008b). Cartoon characters are often used on packages to help children recognize and remember the brand (McNeal & Ji, 2003; Hill & Tilley, 2002). These "child-friendly" elements have been shown to be attractive to children (Hawkes, 2010; Elliott, 2008a). The use of cartoon characters to promote children's food products has been criticized by consumer advocates and academic institutions as deceptive (Roberto, Baik, Harris & Brownell, 2010). This is primarily because children lack the ability to understand the persuasive intent of advertisements (Oates, Blades, & Gunter, 2002; Valkenburg, 2000; Young, Webley, Hetherington, & Zeedyk, 1996) and may choose food

products based on features that they can easily recognize and enjoy such as familiar cartoon characters (Roberto et al., 2010). A more serious concern is the use of front-of-package (FOP) nutrition information such as nutrition claims to promote children's food products as "healthy" (Hawkes, 2010; Elliott, 2008a; Elliott, 2008b). Recent studies have shown that many children's food products with FOP nutrition information were found to be not very nutritious (Sims, Mikkelsen, Gibson, & Warming, 2011; Elliott, 2008b). In addition, research has shown that FOP nutrition information such as health and nutrition claims influence adults' perceptions about a product's nutritional quality (Bech-Larsen & Grunert, 2003; Roe, Levy, & Derby, 1999; Ford, Hastak, Mitra, & Jones Ringold, 1996). Nonetheless, there is relatively little research that examines how children's food packaging influences parents' buying decisions, as well as how packaging influences children's food preferences and behaviour. Parents may be persuaded to buy food products that they believe are healthy (due to FOP nutrition information) and that their children will like (due to cartoon characters), while the food content may not be nutritious at all.

With the increased awareness of healthy eating among the general population, some food companies have begun to use FOP nutrition information as a promotional tool. For example, Kraft, a major food conglomerate in Canada and the US, has produced a range of products with the *Sensible Solution* label (Kraft, 2010). Kraft applied its own nutrition criteria, and qualified products display the *Sensible Solution* label on the front of the package (Kraft, 2010). Among scholars and consumer advocates, such marketing practice has been criticized as misleading and confusing for consumers (Pothoulaki & Chryssochoidis, 2009; Kunkel & McKinley, 2007). In response, the Food and Drug Administration (FDA) in the US and Health Canada are currently investigating the issue. The FDA is poised to standardize the criteria for front-of-package nutrition labelling in the United States (US Food and Drug Administration, 2010) and Canada is also likely to follow suit (Health Canada, 2010a). Recently, the Institute of Medicine (IOM) in the US has released a report recommending the standardization of FOP nutrition labelling into one simple system (Institute of Medicine, 2011). Although the Canadian government has begun to recognize the importance of FOP nutrition information on food packages, governmental regulations standardizing front-of-package nutrition labelling should be seen as a priority.

In Canada, many scholars and non-profit organizations are advocating for regulations of children food marketing to help curb the childhood obesity rates (Elliott, 2008c). Advertising directed toward children is self-regulated by the advertising industry in Canada (Advertising Standards Canada, 2010a). There are no regulations at the provincial or federal level, except for in Quebec (Elliott, 2008c). More importantly, promotions on food packages are not subjected to any form of regulations (Advertising Standards Canada, 2010a). As it currently stands, food packaging is increasingly used to attract children and parents to food products that may not be healthy. Thus, regulations on food packaging should definitely be considered a priority. To increase support for developing such regulations, much evidence is still needed. Specifically, more evidence of how food packaging influences parental perceptions of children's food products is essential.

2.0 LITERATURE REVIEW

2.1 Childhood Obesity

2.1.1 Prevalence of Childhood Obesity

Canada is facing a rapid rise in childhood obesity. Approximately 26% of Canadian children aged 2-17 are overweight or obese (Statistics Canada, 2010). The childhood obesity rate had almost tripled from 1978 - 2004 (Public Health Agency of Canada, 2010), a worrisome prospect considering the magnitude of social and health-related consequences associated with obesity.

Internationally, other developed nations show similar trends in childhood obesity rates. In the United States, 10.4% of children aged 2-5, 19.6% of children aged 6-11, and 18.1% of adolescents aged 12-19 were considered obese in 2007-08; these rates have more than tripled since the 1980's (Centers for Disease Control and Prevention, 2010). Similar to Canada, 24.9% of Australian children aged 5-17 are overweight or obese, a rate which has doubled since 1986 (Australian Government Department of Health and Ageing, 2010). Furthermore, in Europe, approximately 12 million children are either overweight or obese (International Obesity Task Force, 2010). Childhood obesity is clearly a rising trend among many developed nations.

The childhood obesity problem may no longer be exclusive to the western world, as many developing countries are also experiencing rises in childhood obesity rates. The World Health Organization (2010) reported that of the 42 million children 5 years or younger who are overweight or obese, 35 million live in developing countries. This trend may reflect the westernization of many developing nations (Cameron, 2005). Nonetheless, it is apparent that childhood obesity is becoming a global problem. As reported by the International Obesity Task Force (2010), up to 200 million school-aged children are either overweight or obese globally, and 40-50 million of those children are considered obese. The magnitude of the rise in childhood obesity rates clearly demonstrates the need for immediate action across the world.

2.1.2 Health Consequences of Childhood Obesity

Childhood obesity is a great concern because it increases the risk of obesity in adulthood as well as contributes to early development of various chronic diseases including hypertension, cardiovascular disease, type 2 diabetes, sleep apnea, gastrointestinal disease, skeletal abnormalities and some types of cancer (Public Health Agency of Canada, 2010; Daniels, 2006). Rosner, Prineas, Daniels and Loggie (2000) found that children with BMIs above the 90th percentile have greater risks of developing hypertension than children with BMIs below the 10th percentile. Increased BMI in children may also contribute to left ventricular hypertrophy, the increased thickness of the left ventricle of the heart (Yoshinaga et al., 1995). Left ventricular hypertrophy in children may increase the risk of cardiovascular disease (Daniels, 2006). More importantly, being overweight in childhood increases the risk of atherosclerosis, the formation of fibrous plaques along the walls of arteries (Berenson et al., 1998). Atherosclerosis greatly increases the risk of a heart attack or stroke (Daniels, 2006). These findings clearly illustrate that being overweight or obese in childhood leads to the development of various risk factors for cardiovascular disease later in life.

Overweight and obesity in children are also associated with many metabolic disorders including insulin resistance, the metabolic syndrome and type 2 diabetes (Daniels, 2006). The metabolic syndrome is a set of risk factors that contributes to increased risk of cardiovascular disease and type 2 diabetes, which includes high blood pressure, high triglyceride and blood sugar levels and low HDL cholesterol concentrations (National Cholesterol Education Program Expert Panel, 2002). Other obesity related health complications in children include obstructive sleep apnea, gastrointestinal disorders such as non-alcoholic steatohepatitis and gastrointestinal reflux disease, and skeletal abnormalities such as Blount disease (Daniels, 2006). Obesity is also associated with certain types of cancer including breast, colon and endometrial cancers (Public Health Agency of Canada, 2010). Given the number of obesity-related health complications, obese children may end up living less healthy and shorter lives than their parents (Daniels, 2006; Standing Committee on Health, 2007). Thus, it is essential that childhood obesity prevention is a top public health priority.

Furthermore, children who are overweight and obese also experience social and psychological problems due to weight stigma (Puhl & Latner, 2007; Dietz, 1998). They may also have harder time fitting in with other children. For example, a study of at risk of overweight and normal weight children (grades 2-4) found that those who were at risk of becoming overweight were more likely to believe they were less accepted by their peers compared to children of normal weight (Ball, Marshall, & McCargar, 2005). In line with this finding, a recent US study found that being obese is associated with being bullied among children aged 8-11 regardless of gender, race, family socio-economic status (SES), school demographic profile, social skills, or academic achievement (Lumeng et al., 2010). Moreover, obese and overweight children are more likely to become depressed (Bradley et al., 2008) and are at an increased risk of developing low self-esteem (Wang, Wild, Kipp, Kuhle, & Veugelers, 2009). These findings suggest that being overweight or obese may have a detrimental effect on the psychological and social development of children. Thus, childhood obesity interventions must be put in place to ensure healthy development of children.

2.1.3 Economic Cost of Obesity

In Canada, the total economic cost of obesity was estimated in 2002 to be $4.3 billion, of which $1.6 billion is in direct healthcare cost (Katzmarzyk & Janssen, 2004). This estimate may not capture the true cost of obesity as it excludes overweight individuals who are not obese and only includes eight associated chronic diseases (Public Health Agency of Canada, 2009). An older study has estimated the direct health care cost of obesity to be approximately 2.4% of the total health expenditures in Canada (Birmingham, Muller, Palepu, Spinelli, & Anis, 1999). In other developed countries, obesity has been estimated to account for 2-7% of healthcare expenditure, although the true cost is likely higher (World Health Organization, 2010). Thus, the economic cost of obesity is astronomical. If the current trends of childhood obesity are allowed to continue, the economic burdens may exceed the current available resources available to deal with the problem.

2.1.4 Factors Contributing to Childhood Obesity

The underlying physiological cause of becoming overweight or obese is positive energy balance: a result of high energy intake and low energy expenditure (Wofford, 2008). However, many factors influence energy intake and expenditure. These factors include, but are not limited to, diet, physical activity, economic status, social and physical environments, genetics, education and culture (Standing Committee on Health, 2007). These factors work together to influence children's health behaviour, which can lead to becoming overweight or obese.

Of the factors that influence energy intake, one important factor in particular is food marketing to children. Previous studies have shown that children's food knowledge, preferences and behaviour are influenced by food advertising and marketing (Hastings et al., 2003). The World Health Organization and the Food and Agriculture Organization published a joint report in 2003, which they stated that heavy marketing of unhealthy foods and beverages is a probable cause of childhood obesity (World Health Organization, 2003).

2.1.5 Childhood Obesity Interventions

Currently, there is no clear solution for the childhood obesity problem at the population level. Generally, childhood obesity interventions include limiting unhealthy behaviours such as television watching and encouraging healthy behaviours such as physical activity (Gerberding & Marks, 2004). In a systematic review of all available randomized controlled trials for childhood obesity prevention programs, only small changes were found on targeted behaviour (increase physical activity and healthy eating behaviour, decrease sedentary activity and unhealthy eating behaviour) and none on BMI (Kamath et al., 2008). Likewise, a review of school-based childhood obesity programs only found modest changes on behaviours and mixed results for obesity indicators, such as BMI (Sharma, 2006). Both reviews stated that it was not possible to distinguish the effect of the intervention program from other confounding factors. In general, prevention of obesity is more effective compared to intervention aimed at correcting obesity; building healthy habits appears to have more stable long-term results than limiting unhealthy behaviours (Wofford, 2008).

Children develop eating habits and physical activity patterns early in life that last into adulthood (Institute of Medicine, 2006). Early life influences can determine risk of later obesity, and may be suitable targets for future obesity interventions (Reilly et al., 2005). As children begin to form their eating patterns in the early years, early environmental factors such as food marketing may negatively influence their food choices. As a result, they may develop unhealthy habits leading to obesity later in life. Preventing these negative influences in a child's early years may be the key to reducing childhood obesity rates.

2.2 Food Marketing to Children

In the past few decades, food marketing and advertising has been increasingly directed toward children and youth (Story & French, 2004). In the US, food companies spent an estimated $10 billion annually on marketing to children (Institute of Medicine, 2006). This is primarily because children and youth's buying power is expanding (Petterson & Fjellstrom, 2006; Coughlin & Wong, 2002). In addition to being capable of making their own purchases, children and youth can influence household food spending (McNeal, 1999; Kraak & Pelletier, 1998). Children and youth are an important investment for marketers as they represent future adult consumers (McNeal, 1999). Individuals also tend to stay with the brand they know and like into their adulthood (Hawkes, 2010). Thus, food marketers often start with young children in order to influence their brand preference and gain their "life-long" loyalty (Story & French, 2004; Center for Science in the Public Interest, 2003).

A major advantage for marketing to young children is that they are more vulnerable to advertising messages than adults. Previous studies have shown that young children do not understand the persuasive intent of advertising (Oates et al., 2002; Valkenburg, 2000; Young et al., 1996) and are more likely to believe that advertisements are truthful than older children (Institute of Medicine, 2006; Ray & Kledges, 1993). Children only begin to have the cognitive ability to process advertising messages at 11-12 years of age (Young et al., 1996). However, even after they have the ability to understand advertising messages, they are still vulnerable to advertisements that focus on their developmental concerns revolving around their self-image

(Story & French, 2004). Therefore, marketers can influence children at different age groups by catering their messages to match children's cognitive development.

Food companies often promote their products to children using themes of fun, fantasy and taste rather than health and nutrition (Chapman, Nicholas, Banovic, & Supramaniam, 2006; Hastings et al., 2003). They also try to influence children's brand preferences by defining their products as "cool" in their advertising messages (Schor & Ford, 2007). One tactic often used by food marketers is the theme that being different from adults is considered "cool" (Schor & Ford, 2007). For example, food companies try to convey the message that their products are made specifically for children and different from adults' foods (Nestlé, 2006), and that children, not adults, should control their own food choices (Center for Science in the Public Interest, 2003). By using themes that will attract children's attention, marketers are clearly sending the wrong messages that may lead children to associate foods with inappropriate concepts (fun and cool) rather than health and nutrition (Elliott, 2008b).

2.2.1 Children's Influence on Parents' Purchase Decisions

Food marketing to children is used to elicit "pester power" (Marshall, O'Donohoe, & Kline, 2007). Pester power is children's attempts to influence parental purchase via repetitive behaviours (Nicholls & Cullen, 2004). Research has shown that it is an effective method of getting parents to purchase food products. Gelperowic and Beharrell (1994) found that mothers, more often than not, gave in to their child's pestering to avoid argument. Thirty-three percent of mothers reported that their child did have an influence on their purchase behaviour (Gelperowic & Beharrell, 1994). Furthermore, McNeal (1992) reported that between 40 and 80 percent of children's purchase requests were granted by parents. McNeal (1999) also reported that parents gave in to their children's requests 50% of the time for food.

2.2.2 Food Marketing Channels

Food marketing to children occurs via various communication channels. These channels include but are not limited to television advertising, in-school marketing, product placement, the internet, and food packaging.

Television Advertising

Television advertising is the dominant form of food promotion to children. It is a popular advertising channel because it can reach a large audience and encourage brand recognition (Gallo, 1999). In the US, over 75% of manufacturers' and 95% of fast food restaurants' advertising budgets were allotted to television ads (Gallo, 1999). Similarly, 75% of all advertising in the UK occurs on television (Hastings et al., 2003). Children view approximately 20,000-40,000 commercials per year (Strasburger, 2001). While it is still the leading advertising channel, television advertisement is declining as multiple approaches to marketing become more prevalent, as will be discussed in the following paragraphs (Hastings et al., 2003).

Food and toys make up the majority of children's television advertisements (Hastings et al., 2003). On average, children see about 65 television ads each day, and about half are for food items (Institute of Medicine, 2006). Food advertisements on television are dominated by five categories: breakfast cereals, confectionary, snacks, beverages and fast food restaurants (Hastings et al., 2003). One US study examined the prevalence of food ads on Nickelodeon, the most watched children's television channel in the US (Batada & Wootan, 2007). The study found that during 28 hours of programming, the most common advertised food products were sugary cereals, fast-food restaurants and pastries. About 88% of these food products were considered to be of poor nutritional quality. Not surprisingly, promotion of healthy foods such as fruits or vegetables was relatively scarce (Story & French, 2004; Hastings et al., 2003).

In an international study of television food advertising to children, it was found that for Canada, children saw four food ads per hour during peak viewing times and six food ads per hour during non-peak times (Kelly et al., 2010).

In-school Marketing

In-school marketing is another popular advertising channel due to access to a large population of children and schools' financial shortages, which makes schools vulnerable to advertisement deals (Story & French, 2004; Levine, 1999). Food companies often use sponsorship to advertise their food products to students, including contests, coupons, sport teams and educational

materials (Story & French, 2004; Center for Science in the Public Interest, 2003). In line with foods advertised on televisions, foods advertised in schools are dominated with poor nutritional quality products such as soft drinks, snacks and fast foods (Center for Science in the Public Interest, 2003; Levine, 1999).

Product Placement

Product placement has become a popular marketing medium, and involves the incorporation of a brand name, product package or other trademark visually or verbally in television programs, movies, radio shows, magazine articles, etc. (Institute of Medicine, 2006; Story & French, 2004). Product placement is an effective way to market to children because children often fail to recognize that it is advertising due to its integration in the media program (Center for Science in the Public Interest, 2003).

Internet

The Internet is becoming a common channel for children's advertising and marketing. Food companies often integrate advertising into interactive website content such as games, quizzes, and contests (Story & French, 2004). Appearances of popular brand characters such as Tony the Tiger or Toucan Sam (Kellogg's) are also common (Story & French, 2004). Advertising through the Internet may provide more exposure and positive brand interaction, which is essential to the development of brand preference and loyalty (Center for Science in the Public Interest, 2003).

Food advertising is not limited to food company websites but can also be featured on other popular children's websites including Disney.com, NickJr.com and FoxKids.com (Story & French, 2004). Alvy and Calvert (2008) analyzed food marketing content on children's websites (targeted at children aged 8 to 11 years old) and found that 7 out of 10 websites contained food advertising. More importantly, the foods advertised were found to be of poor nutritional quality, and included advertisements for candies, sugary cereals, snacks and fast food restaurants.

2.2.3 The Effects of Food Marketing on Children

Hastings and colleagues (2003) conducted a comprehensive review of food marketing to children and found that food marketing influences children's food knowledge, preferences and behaviour. Specifically, in their reviewed studies, it was found that exposure to advertisements for foods low in nutritional quality was associated with poorer nutritional knowledge in children. In contrast, exposure to food ads had little influence on children's perceptions of a healthy diet (Hastings et al., 2003). With regards to food preferences, Hastings and colleagues' reviewed studies found that exposure to food advertisements was associated with children's preferences for foods high in fat, salt and sugar. Children who were exposed to food ads were also more likely to make more requests of their parents or pester them to purchase advertised food products (Institute of Medicine, 2006; Story & French, 2004; Hastings et al., 2003; Coon & Tucker, 2002). In addition, exposure to food advertisements was found to have a modest effect on children's food consumption behaviour. For example, exposure to food ads was associated with reduced likelihood of selecting fruit juice for consumption and increased intake of snacks (Hastings et al., 2003). In the short-term, food advertisement increases children's consumption of advertised foods (Institute of Medicine, 2006; Story & French, 2004; Hastings et al., 2003). These findings indicate that food advertisements have substantial influence on children's dietary knowledge, preferences and behaviour, and thus, there is a need to guard children from exposure to ads that promote foods of poor nutritional quality.

In line with these findings, Livingstone (2005) conducted a review of review studies on food marketing to children and concluded that food advertisement has a direct effect on children's food preferences and behaviour. This statement is supported by a comprehensive review of the impact of food marketing to children and youth by the Institute of Medicine in 2006. They reported that television advertisement influences children's preferences and requests for foods high in energy and low in nutrients, and increases their short-term consumption of advertised foods. Particularly, the effect of advertising was found to be stronger among younger children (Institute of Medicine, 2006). Nonetheless, many of these findings were found for only televised food advertisement; research on the effect of other forms of food marketing to

children, such as packaging and labelling, is clearly needed. The lack of research on other forms of marketing is highlighted in many of the reviews on food marketing to children.

2.3 Packaging

2.3.1 Packaging as a Marketing Tool

The package is defined as a container which holds, protects and identifies the product throughout its distribution channel (Ampuero & Vila, 2006). Packaging also performs a marketing function (Prendergast & Pitt, 1996). Hawkes (2010) describes packaging as a marketing medium which combines all the four "Ps" of marketing: product, public relations, price and promotions. According to Hawkes, the package contains the product, conveys message about its attributes (public relations) and its price, while also carrying promotions. A well-designed package may help sell the product by attracting consumers' attention (Ampuero & Vila, 2006).

The use of packaging as a marketing tool is increasing (Rettie & Brewer, 2000). Hawkes described packaging as playing a major role in the marketing mix, taking away funding from other forms of advertising. A major reason for this trend is that many purchase decisions are being made at the point of sale (Silayoi & Speece, 2007). Companies are recognizing this trend and the opportunity for the package to act as a promotional tool right before the purchase decision (Ampuero & Vila, 2006). Another reason that packaging is being used as a marketing tool is the increase in the number of brands and products in the market place (Ampuero & Vila, 2006). The package, thus, becomes an important medium for product differentiation and brand awareness.

Behaeghel (1991) and Peters (1994) considered packaging an important marketing tool for the following reasons: it reaches all consumers in the market segment, it is present right before the purchase decision is made, and it interacts with the consumers as they examine the package to obtain information they need. Similarly, McNeal and Ji (2003) emphasized that the package often accompanies the use of the product, and therefore, increases the transmission of values and product characteristics to the consumers.

2.3.2 Packaging and Consumers' Purchase Decisions

Packaging plays an important role in a consumer's purchase decision: it is the first thing consumers see before deciding to buy in the store (Ampuero & Vila, 2006). The Henley Centre study found that 73 percent of purchase decisions are made at the point of sale with packaging as a key influence (Rettie & Brewer, 2000). Consumers often use packaging characteristics to evaluate product quality. Research has shown that if the package conveys high quality, then consumers will likely associate high quality with the product and vice versa (Silayoi & Speece, 2004). A consumer's level of involvement is also an important factor in product evaluation. In marketing literature, low-involvement refers to the purchase of a low-priced product with little importance, and is often done without careful examination of brand and product information (Silayoi & Speece, 2004; Kotler, Ang, Leong, & Tan, 1996). High-involvement purchase, on the other hand, refers to the purchase of high-priced product that has high importance; therefore, consumers evaluate product information more carefully before making the decision to buy (Silayoi & Speece, 2004; Vakratsas & Ambler, 1999).

Other factors that play a role in product evaluation include consumer segmentation and culture. Different consumer segments and cultures may place different values on product characteristics such as colour (Walle, 1997). For instance, a colour may influence product perceptions differently among youth market or eastern culture in comparison to adult market or western culture.

2.3.3 Packaging Elements

Silayoi and Speece (2007) identified four main packaging elements that are associated with consumer purchase decisions. These elements include graphics, packaging size and shape, product information, and packaging technology.

Graphics

As mentioned above, a consumer's evaluation of product depends on his or her level of involvement (Vakratsas & Ambler, 1999). In a low-involvement situation where the product is less important, graphic elements such as colours and pictures have stronger impact on

consumers (Kupiec & Revell, 2001; Grossman & Wisenblit, 1999). The opposite is true for high-involvement situations where the purchase decision is more influenced by product information than graphics (Grossman & Wisenblit, 1999). Graphic elements include colours, pictures, typography and visual layout (Silayoi & Speece, 2007). The total presentation of graphic elements communicates a brand image which is an important differentiation method at the point of sale (Silayoi & Speece, 2007).

The effect of colour on consumers' perceptions of products is well-studied (Imram, 1999). Consumers often associate colours with product attributes such as flavour, nutrition, satisfaction level, etc. (Imram, 1999). For example, red is a popular colour for packaging and it is often associated with excitement and sweetness (Center for Science in the Public Interest, 2003). Food companies such as Coca-Cola and Kellogg's often use red on their product packages (Center for Science in the Public Interest, 2003). Colours can also convey product quality and value. In their study, Ampuero and Vila (2006) found that high-priced products that target the upper class often use cold and dark colours such as black on their packaging whereas low-priced products aimed at price-sensitive consumers often use light colour such as white. Colour can also help foster brand awareness. Product packages with unique colours allow consumers to easily identify the brand and product in the store (Grossman & Wisenblit, 1999). Consumers may also learn to prefer certain colours for different product categories (Grossman & Wisenblit, 1999), which is also dependent on cultural values and other factors such as age and sex (Walle, 1997).

The use of pictures on packages is another important differentiation method at the point of sale (Underwood, Klein, & Burke, 2003). In low-involvement situations where consumers spend little time evaluating the product, pictures have a stronger impact in the evaluation process than product information (Kupiec & Revell, 2001; Grossman & Wisenblit, 1999). This is because pictures are more vivid stimuli compared to words and are quicker and easier for consumers to understand (Silayoi & Speece, 2007; Underwood et al., 2003). As with colours, the type of pictures used can influence perceptions about the product. Ampuero and Villa (2006) found

that upper-class products often use pictures showing the product on the package whereas products targeting price-sensitive consumers often use pictures showing people.

Similar to colours and pictures, typography is also used to convey product attributes. Ampuero and Villa (2006) found that high-priced products tend to use bold, large, roman and upper-case letters whereas low-priced products tend to use serif and sans serif fonts. Visual layout is also another crucial factor for product differentiation and brand awareness. Research has shown that consumers recall visual elements better depending on their position on the package and type of stimuli (Rettie & Brewer, 2000). Recall is better for verbal stimuli (words) when it is placed on the right-hand side of the package and better for non-verbal stimuli (pictures) when it is on the left-hand side (Silayoi & Speece, 2007).

Many consumers today often buy on impulse due to time pressure; therefore, a well-designed package may help them make decisions quickly in the store (Hausman, 2000). Graphic elements are important tools for differentiating the product in the marketplace (Herrington & Capella, 1995). They also influence perceptions about the product. While viewing the product's package, consumers may imagine how the product looks, feels, tastes and smells (Underwood et al., 2003). A well-designed package will likely attract attention and influence purchase decisions.

Size and Shape

Packaging size and shape are also important factors that affect consumers' perceptions about the product. Consumers often use size and shape to judge product volume, with elongated shapes being perceived as larger (Silayoi & Speece, 2007). Package size is also used to influence price perception. Cheaper products (generic) are often packaged in large sizes (Silayoi & Speece, 2007) giving the impression that they are a good value for the price (Prendergast & Pitt, 1996).

Product Information and Technology

Product information on the package is used by consumers to evaluate the product, especially in high-involvement situations. Some companies often use very small fonts and dense writing styles to maximize the amount of information on the package, which can lead to confusion due

to reduced readability and too much information present (Silayoi & Speece, 2007). Consumers may look to other packaging attributes to evaluate the product. Therefore, a balance in the amount of information present is needed to reduce confusion and decrease the difficulty of purchase decisions (Silayoi & Speece, 2007).

Packaging technology is a feature of packaging related to informational elements as it conveys information about a consumer's lifestyle (Silayoi & Speece, 2007). For example, as many consumers are under time pressure, packaging technology that enhances the convenience of product consumption will be attractive to these consumers.

2.4 Children's Food Packaging

Food marketing to children often combines food products with "fun" or "entertainment" concepts, inadvertently creating a new category of food just for children (Elliott, 2008b). Elliott has termed this new food category "fun foods" whereas Roberts (2005) refers to it as "eatertainment". Many food companies often use packaging to communicate these "fun" and "eatertainment" concepts using various methods. They may use cross-promotions with children's TV shows or movies, athletes, sports teams, celebrities or events (Hawkes, 2010). Other promotional methods include premium offers inside the package, such as toys, stickers, trading cards; competition such as contests, games or puzzles on the package; or unusual food shapes and colours (Hawkes, 2010; Roberts, 2005; Fitzhugh & Lobstein, 2000).

Cross-promotion on packaging is the most common strategy to market food products to children (Hawkes, 2010). Animated characters (cartoon characters from TV shows or movies) are often featured on children's food products. In an Australian study, 75% of food products examined in supermarkets used promotions based on television or movie characters and cartoon characters (Chapman et al., 2006). Some companies also create their own brand characters. For example, Kellogg uses Tony the Tiger, Snap, Crackle, and Pop and Toucan Sam to promote their cereal products (Center for Science in the Public Interest, 2003). Cross-promotion on packaging is effective because parents find it difficult to refuse their children food products endorsed by their favourite cartoon characters or celebrities (Kelly, Turner, & McKenna, 2006).

Besides animated characters, other visual elements are also used to attract children's attention. In her study, Elliott has highlighted the use of colours, typescripts and other visual elements on the package to attract children (Elliott, 2008b). She found that children's food products were dominated by four colours: blue, yellow, red and green. Approximately 85% of the products used cartoonish typescripts and three quarters included a cartoon visual. With the increasing trend of healthy eating, many food products also incorporated nutrition claims to attract parents to children's food products (Hawkes, 2010). Elliott reported that over three-fifths of children's food products included a nutrition claim.

Other important packaging elements, as previously discussed, include size, shape and technology. These are also used to attract parents and children to food products. Larger packages often give parents the impression of good value, whereas small and fun packages are attractive to children (Hawkes, 2010). Packaging technology that allows children to serve themselves, for examples, straws for small juice packages (Hawkes, 2010) or tubed yogurt that can be squirted into the mouth (Chapman et al., 2006), is appealing to children who may want to express their independence during meal consumption (Center for Science in the Public Interest, 2003).

2.5 Effects of Food Packaging on Parents and Children

According to Gelprowic and Beharrel (1994), attraction to packaging can induce "pester power" in children. Research has shown that children's attraction to packaging may depend on age: younger children are more attracted to cross-promotions on the package such as cartoon characters, whereas older children find other visual elements more appealing (Elliott, 2008a). Parents also use packaging elements to make purchase decisions (Wells, Farley, & Armstrong, 2007). Mothers in Gelprowic and Beharrel's (1994) study reported that they gave in to their children's requests due to packaging, especially if they perceived the product to be healthy.

As with any marketing strategies, the goal of packaging is to create brand awareness (Hawkes, 2010). A focus group study in the UK found that children recognize brand characters on breakfast cereal packages (Hill & Tilley, 2002). Brand characters help children to recognize the

brand (McNeal & Ji, 2003) and aim to create "brand loyalty", in which children stay with the brand for life (Hawkes, 2010). Brand characters seem to be effective at creating positive attitude towards a brand (Garretson & Burton, 2005) and is associated with increased liking for a product, especially if the brand character is familiar and trusted (Mizerski, 1995). Moreover, cartoon characters also appear to influence children's food preferences. In the Elmo/Broccoli study conducted by the Sesame Workshop (2008), it was found that the presence of a cartoon character (Elmo) on the food package can influence children's food choices. When presented with a choice of a chocolate bar or a broccoli package, 78% of the children chose the chocolate bar in the control condition (no cartoon character). However, when an Elmo sticker was added to the broccoli package, 50% of the children chose the broccoli package over the chocolate bar. In a recent study by Roberto and colleagues (2010), children were more likely to prefer the taste of graham crackers and gummy fruit snacks when a cartoon character appeared on the package. These studies illustrate that the mere presence of a well-known cartoon character can influence children's food choices, and that the effect may also occur for healthier food.

Other packaging elements also influence children's perceptions about the food product. Marshall, Stuart and Bell (2006) found that children preferred brightly coloured packages because they are perceived as fun and exciting. Likewise, Allison (1999) found that children (9-10 year olds) selected more favourable attributes to describe colourful packaging as opposed to plain packaging even though the food content was rated the same in blind taste-testing. For example, red packaging was attributed to a more favourable lifestyle compared to white packaging. Packaging also appears to affect taste perception in children. In a US study, children rated the taste of food in the branded package better than the plain package, even though both foods were the same (Robinson, Borzekowski, Matheson, & Kraemer, 2007). Parents also prefer colourful packaging because they believe it will encourage their children to eat the food (Gelperowic & Beharrell, 1994).

Nutrition claims on the food package have been found to affect adults' perceptions of a product's healthfulness (Bech-Larsen & Grunert, 2003; Roe et al., 1999; Ford et al., 1996). Hawkes (2010) suggests that children may also believe that the product is healthy because it

displays such claims. They may also associate package colour (e.g. green), ingredient list, and symbols as indications of healthfulness (Hawkes, 2010). While adults use both visual and informational elements to make purchase decisions (Silayoi & Speece, 2007), children may rely entirely on visual elements when evaluating the product due to their lower cognitive skills (Ogba & Johnson, 2010). Unlike parents, who judge food products based on nutritional information, children tend to judge a food product based on a cartoon character that they easily recognize. Most concerning is that nutrition claims may be misleading parents into believing that a food product is healthy when it is not (Hawkes, 2010). In her survey of children's food products, Elliott found that most children's food products with nutrition claims were not actually nutritious when judged against the Centre of Science for Public Interest's Criteria for food of poor nutritional quality (Elliott, 2008b).

Elliott (2008b) pointed out that this new category of children's food, "fun foods", deserves closer attention when examining factors contributing to childhood obesity mainly because they are not very nutritious. In her survey of children's food products in a Canadian supermarket, Elliott found that less than 1% of "fun foods" were fruits and vegetables where as 89% were of poor nutritional quality due to high levels of fat, sugar or sodium. Chapman and colleagues (2006) also found that food promotions in Australian supermarkets were mostly for unhealthy foods, with 82% of all promoted foods being unhealthy choices. Likewise, a recent US study found that 84% of children's food products with front of package labelling systems were not healthful due to high levels of sugar, sodium, saturated fat, and low levels of fibre (Sims et al., 2011). Thus, it is quite alarming that a large proportion of children's food products are considered unhealthy. In addition to children's foods being mostly non-nutritious, Elliott (2008b) suggests that the marketing of children's food as "fun" and "entertainment" may distort children's view of food in general. Children may come to associate food with fun and entertainment and not with health and nutrition. As a result, children may develop unhealthy eating habits because their parents are persuaded to buy these non-nutritious foods for them. These factors are, without a doubt, contributing factors to the current childhood obesity epidemic.

2.6 Nutrition Labelling

When shopping for food products, consumers rely on a variety of clues to help them make purchase decisions. Nutrition labelling is one information source consumers use to evaluate food products, especially at the point of purchase (Silayoi & Speece, 2007). Nutrition information on food packaging includes the nutrition facts table, the ingredient list, and nutrition claims. In 1984, Kellogg's became the first food company to use a health claim to promote their cereal products by highlighting the relationship between fibre intake and cancer prevention; since then nutrition claims have become widely used on food packages (Mitra, Hastak, Ford, & Jones Ringold, 1999; Ippolito & Mathios, 1991). Concerns about misleading nutrition claims prompted the US congress to pass the Nutrition Labelling and Education Act (NLEA) in 1990, which was implemented by the Food and Drug Administration (FDA) in 1994 (Mitra et al., 1999; Ford et al., 1996). The NLEA requires most foods to display nutritional information, usually in the form of the nutrition facts table, which provides information on serving size, calories, and daily values for key nutrients (US Food and Drug Administration, 2011). The FDA remarked that any nutrition claims on food product that is high in total fat, saturated fat, cholesterol or sodium is misleading and thus, cannot be used on food packages (Ford et al., 1996). In Canada, under the Food and Drugs Act, Health Canada established standards for food labelling while the Canadian Food Inspection Agency (CFIA) enforces those regulations (Health Canada, 2008). The regulations, published in 2003, mandated the requirement of nutrition labelling on most food labels as well as updating requirements for nutrient content claims and for the first time in Canada, allowed the use of health claims on food packages (Health Canada, 2008).

Upon the implementation of the NLEA in the US, many studies were conducted to examine the effect of the changes to nutrition labelling. The results of these studies have been mixed. For example, some studies have claimed that the implementation of nutrition fact tables have increased consumers' nutritional knowledge (Moorman, 1998), whereas others have suggested it has added to more confusion due to the difficulty consumers face with interpreting the information (International Food Information Council, 2006). Nevertheless, common trends with

regard to nutritional label usage have been identified. Consumers who are female, older, with higher income and education levels, and the primary shopper of the household tends to read nutrition labels before making purchase decisions (Drichoutis, Lazaridis, & Nayga, 2006; Kim, Nayga, & Capps, 2001). Other individual characteristics such as product knowledge, awareness, familiarity, scepticism, motivation, health status, as well as the format and content of the labels also affect nutrition label usage (Burton & Andrews, 1996). In a focus group study on the use of nutrition labels, many consumers reported that nutrition labels are hard to understand (International Food Information Council, 2006). Consumers are confused with regards to the interpretation of serving sizes and daily values on the nutrition facts table (International Food Information Council, 2006). The complex information present on nutrition labels is a major deterrent for many consumers. Thus, it is not surprising that consumers with higher education levels are more likely to read food labels than those with lower education levels. A study on global usage of nutrition labels by ACNielsen (2005) found that only 2 out of 10 consumers read nutrition labels in North America, Asia and Europe. The low rate of nutrition label usage may be a reflection of the difficulty consumers have with interpreting the nutrition information presented on the package.

2.6.1 Nutrition Information

As mentioned previously, the use of nutrition information to promote children's food products as "healthy" needs a closer examination, especially considering they may be deceptive. In Canada, only one type of nutrition information, nutrition claims, is regulated by the government. Nutrition claims consist of two types: nutrient content claims and health claims (Health Canada, 2008). Nutrient content claims describe specific nutritional attributes of food products, for example, "low fat," "high fibre", etc., while health claims describe relationships between foods or food components and a person's health (Health Canada, 2008; Williams, 2005). In Canada, there are 13 types of nutrient content claims (for more information please refer to http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/claims-reclam/table1-eng.php). On the other hand, health claims are grouped into three main categories: disease risk reduction and therapeutic claims, function claims, and general health claims (Canadian Food

Inspection Agency, 2010; Health Canada, 2007). These health claims are regulated by the Canadian Food Inspection Agency in Canada. Table 1 describes and provides examples of the three types of health claims.

Table 1: Types of Health Claims

Types of Health Claims	Description	Examples
1. Disease Reduction and Therapeutic Claims	Statements that describe the relationship between the intake of food or a food component and a reduced risk of developing a disease or condition; or statements that describe the therapeutic effect of food or a food component on body functions.	*"A healthy diet with adequate calcium and vitamin D, and regular physical activity, helps to achieve strong bones and may reduce the risk of osteoporosis."*
2. Function Claims	Statements that describe specific benefits of consuming food or a food component on normal body functions or biological activities of the body.	*"Consumption of green tea helps to protect blood lipids from oxidation* and *1/4 cup of Product X contains 7 grams of coarse wheat bran, which promotes regularity."*
Nutrient Function Claims (Subset of function claims)	Statements that describe well-known roles of energy or nutrients on growth and development	*"Vitamin A aids in the development and maintenance of night vision."*
3. General Health Claims	General statements that provide dietary guidance and promote healthy eating with no reference to a specific health effect, disease or condition.	*"Include low fat product x as part of healthy eating."*

SOURCE: Chapter 8 - Health Claims (Canadian Food Inspection Agency, 2010); Questions and Answers on Health Claims (Health Canada, 2010b)

In addition to the regulated nutrition information described above, there are other types of nutrition information used on food packaging that are not government regulated. These unregulated nutrition information may use symbols such as hearts, bones, or check marks and

slogans such as “healthy choice,” “nutritionist recommended,” or “good for you” (Canadian Food Inspection Agency, 2010; Coulson, 2000) to denote general nutritional or health values (L'Abbe, Dumais, Chao, & Junkins, 2008). They may be used alone or together with the regulated nutrition information (L'Abbe et al., 2008). In Canada, examples of unregulated nutrition information include President’s Choice *Blue Menu* products, Kraft Canada’s *Sensible Solution* logo and the Heart and Stroke Foundation’s *Health Check* program (see figure 1).

Figure 1: Unregulated Health Symbols in Canada

As mentioned above, there are no specific standards or regulations for determining which foods may carry this type of nutrition information (L'Abbe et al., 2008). Many of the unregulated nutrition information are often developed by food companies or organizations with their own set of standards.

Some food companies incorporate both regulated and unregulated nutrition information on their product packages in an attempt to help consumers identify healthier food choices while promoting sales at the same time (Coulson, 2000). In addition, the absence of government regulations allows food companies the discretion to develop their own standards for these types of nutrition information. Kunkel and McKinley (2007) analyzed the use of unregulated nutrition labelling by two of the US largest food conglomerates, Kraft Foods and PepsiCo. Kraft has introduced the *Sensible Solution* label and icon and PepsiCo has introduced the *Smart Spot* logo. Kunkel and McKinley reported that although both companies attempted to produce a labelling system that will help consumers choose healthier products, there are inconsistencies in the criteria used. For example, PepsiCo will label a snack with *Smart Spot* if the product contains less than 270 mg of sodium or 60 mg of cholesterol whereas Kraft will apply *Sensible Solution* if the product contains less than 290 mg of sodium and there was no mention of

cholesterol. The inconsistencies in the criteria used may cause confusion to consumers (Kunkel & McKinley, 2007); they may be puzzled as to which product is truly healthy. In addition, Kunkel and McKinley also pointed out that these products may meet the company's "criteria" and are labelled as healthy only because the problematic nutrients such as fat or sugar have been reduced. The food product may contain very little of other nutrients such as vitamins and minerals, and thus, cannot really be considered nutritious or healthy.

As previously mentioned, there were a number of studies that took place after the implementation of the NLEA in the US to examine the effect of the changes that had occurred. Some of these studies reported that nutrition claims influence consumers' perceptions of product healthfulness and product liking (Bech-Larsen & Grunert, 2003; Roe et al., 1999; Ford et al., 1996) but not their preconceived idea about the product (Kozup, Nayga, & Capps, 2001; Mazis & Raymond, 1997). Roe and colleagues (1999) found that participants who looked at health claims or nutrient content claims gave higher ratings on product healthiness and purchase intention than participants who looked at the nutrition facts table. Health claims also created halo effects in the study, in which the participants reported positive association with nutrition attributes not related to the health claim (Roe et al., 1999). One particular concern is the finding by Roe and colleagues that the presence of health claims or nutrient content claims was associated with information search limited to the front panel. Consumers may skip reading the nutrition facts table on the back or side panel when they see health claims or nutrient content claims on the front panel. They may believe that the product is healthy as suggested by the health claims or nutrient content claims, while the nutrition facts table might have indicated otherwise. Thus, nutrition claims can lead to misconception about a product's healthfulness.

On the other hand, Ford and colleagues (1996) found that health claims did not influence the processing of nutrition information when participants examined both health claims and the nutrition facts table. This finding supports the idea that consumers give greater weight to the nutritional facts table, and health claims may not have much influence as long as consumers pay attention to the nutrition facts tables. Mitra and colleagues (1999) also found that health

claims did not influence the processing of nutrition facts table information. When both health claims and nutrition facts table were available, only the nutrition facts table influenced the perceptions of product healthfulness. In addition, the results were independent of respondent education level. Furthermore, Garretson & Burton (2000) found that a product's nutrition facts table had an influence on brand attitude, nutrition attitude and purchase intention while health claims did not, suggesting that most consumers rely on the nutrition facts table when making nutrition-related evaluations. A relatively recent study that examined consumer perceptions of nutrition and health claims across four different countries (Italy, Germany, UK, and US) found that nutrition claims have relatively little influence on consumers' overall perceived healthiness of the product (Van Trijp & Van der Lans, 2007).

In general, nutrition claims appear to influence consumers' perceptions of a product's nutritional quality in the absence of the nutrition facts table. Given the time pressure that some consumers face while shopping, the presence of nutrition claims may lead individuals to limit their information search to only the front panel (Roe et al., 1999). Thus, consumers may rely on nutrition claims more than the nutrition facts table when evaluating food products. The difficulties in interpreting nutrition information on the nutrition facts table may also contribute to the preference of nutrition claims (Williams, 2005). This is especially important, given the lack of standardized criteria for the unregulated nutrition information, which may lead to misperception of a product's healthfulness (Pothoulaki & Chryssochoidis, 2009; Kunkel & McKinley, 2007). In response to such concern, the US FDA is in the process of standardizing front-of-package labelling nutrition criteria (US Food and Drug Administration, 2010) while Health Canada is also investigating the issue (Health Canada, 2010a). The misrepresentation of a product's healthfulness and confusion caused by health claims is highlighted in 2009, when the FDA removed the Smart Choices labelling system after it appeared on unhealthy food products (sugary cereals) in the US (US Food and Drug Administration, 2009).

2.7 Regulations on Children's Advertising and Marketing

In Canada, advertising and marketing to children is self-regulated by the industry. The industry follows two codes established and monitored by Advertising Standards Canada: the Canadian

Code of Advertising Standards (Advertising Standards Canada, 2010a) and the Broadcast Code for Advertising to Children (Advertising Standards Canada, 2010b). Under the Canadian Code of Advertising Standards, provision 12, it is stated that, "Advertising that is directed to children must not exploit their credulity, lack of experience or their sense of loyalty, and must not present information or illustrations that might result in their physical, emotional or moral harm" (Advertising Standards Canada, 2010a). The Code applies to advertisements by corporations, organizations or institutions, governments and crown corporations and excludes foreign media and packaging, wrappers and labels (Advertising Standards Canada, 2010a).

The Broadcasting Code for Advertising to Children is directed at broadcast advertising for children. Canadian broadcasters have agreed to adhere to the children's code as a condition of Canadian Radio-television and Telecommunications Commission (CRTC) licensure (Advertising Standards Canada, 2010b). The code states that any ad cannot be aired more than once in a half-hour children's program. If the program is longer than one half hour, the same rule still applies. The advertising message cannot exceed four minutes per one-half hour of children's programming. The code also prohibits the use of puppets, persons and characters (including cartoon characters) well-known to children and/or featured on children's programs to promote products, premiums or services. However, the advertiser may create their own puppets, persons or characters to promote their products.

Specifically, any food ads that do not follow the Canadian Food Inspection Agency's guidelines will be regarded as a violation of the code (Advertising Standards Canada, 2010b). In addition, the food ads also should not discourage consumption of healthy foods such as fruits and vegetables and should not exceed the serving size on the nutrition facts table (Advertising Standards Canada, 2010b).

Regulations on children's advertising appear stricter in other jurisdictions. For example, Australia prohibits food advertisements to children younger than 14, the Netherlands restricts adverting of confectionary products to children younger than 12, and Sweden bans cartoon characters from appearing on advertisements to children younger than 12 (Nestlé, 2006). However, similar to Canada, the US's regulations only apply to the length of time the

advertisement is shown on television (12 minutes per hour on weekdays and 10.5 minutes per hour on weekend) (Nestlé, 2006).

There are no governmental regulations on food marketing and advertising toward children at the federal or provincial levels in Canada except in Quebec (Elliott, 2008c). In addition, regulations on other forms of food marketing such packaging do not exist. As such, given the findings that food marketing is linked to rising childhood obesity rates, it is essential that food marketing and advertising toward children is regulated. Many scholars and non-profit organizations in Canada are advocating for regulations of children food marketing to help curb the childhood obesity rates (Elliott, 2008c).

2.8 Summary

Childhood obesity rates are rising rapidly in Canada and globally. Marketing of foods of poor nutritional quality is a contributing factor to childhood obesity. Food packaging is becoming an increasingly important marketing tool. Packaging elements such as cartoon characters attract attention from children, which may also influence parents' buying decisions. The use of nutrition claims or symbols can also influence parents' buying decisions given the current trend of interest in healthy eating. Little research has been done to examine this area, especially in Canada, in which there are no federal regulations restricting food marketing.

3.0 RESEARCH RATIONALE

3.1 Rationale

Canada has one of the highest childhood overweight and obesity prevalence rates in the western world, at 26% (Statistics Canada, 2010). Food marketing of non-nutritious food is a contributing factor in the rising rates of childhood obesity (Harris et al., 2009; Institute of Medicine, 2006). Relatively few studies have examined the role of packaging for children's food products and the extent to which specific elements shape perceptions of food quality among parents, particularly within the Canadian context. The current study is timely given the current climate surrounding the use of nutrition claims on front-of-package labelling. In the US, the FDA is currently developing standard nutrition criteria for front-of-package nutrition claims (US Food and Drug Administration, 2010). Canada still does not have specific governmental regulations within these areas, especially with regards to food marketing and advertising to children (Elliott, 2008c); therefore, evidence for developing such regulations is much needed.

3.2 Purpose and Research Questions

The current study sought to examine the influence of packaging design on parents' perceptions of food products targeted at children. The study examined four types of FOP nutrition information that are used to promote food products as healthy. In addition, four popular cartoon characters were examined alone and together with the FOP nutrition information to determine whether they influence parents' perceptions about the products.

The specific research questions were:

1. To what extent do cartoon characters and/or FOP nutrition information influence parents' belief that their children will find the food product appealing?
2. To what extent do cartoon characters and/or FOP nutrition information influence parents' perception of the food product's nutritional quality? Do parents believe that food products with cartoon characters and/or FOP nutrition information have higher (or lower) nutritional quality?

3. To what extent do cartoon characters and/or FOP nutrition information influence parents' intention to buy the food product? Do parents have higher (or lower) intention to buy food products with cartoon characters and/or FOP nutrition information?
4. To what extent do cartoon characters and/or FOP nutrition information influence parents' willingness to pay for the food product? Are parents more (or less) willing to pay for food products with cartoon characters and/or FOP nutrition information?
5. To what extent do parents find the FOP nutrition information believable?
6. To what extent do parents find the FOP nutrition information easy to understand?
7. To what extent do parents find the FOP nutrition information effective at helping them to choose healthy food?

4.0 METHODS

4.1 Design Overview

The study was conducted using a 2 × 2 mixed factorial design. The two factors that were examined were cartoon characters and front-of-package (FOP) nutrition information. An online survey was conducted with parents of children ages 4-10 years old. Participants were shown a series of food product images and were asked to rate each product on appeal, nutritional quality, intention to buy and willingness to pay. At the end of the survey, participants were shown all of the FOP nutrition information used in the study and they were asked to rate each FOP nutrition information on believability, ease of understanding, and perceived effectiveness. Participants were also asked to rank each type of FOP nutrition information on perceived effectiveness.

4.2 Participants and Recruitment

Participants consisted of 1,001 parents (both males and females) recruited from a national sample in Canada. Participants were at least 18 years old, a parent of at least one 4-10 year old child and the primary shopper of their household. Participants were recruited from a consumer panel through Global Market Insite (GMI), a market research company. To register with GMI, participants must first provide their contact information and agree to GMI's privacy policy and user agreement. Next, they were prompted to check their email for a confirmation notice. Participants must click on a link contained in a registration email to activate their membership. Respondents in GMI's participant pool were invited to participate in online web surveys by email. Participants were given an incentive equivalent to 2 to 3 USD from GMI to complete the survey.

4.3 Study Protocol

Participants completed the survey online. Participants were sent email invitations to complete the survey from GMI. Once participants opened the survey link, they were presented with the screener questions (age 18 or over, parent of a child ages 4 to 10 and primary household shopper). Eligible participants were provided with an overview of the study and were asked to

provide consent. The survey assessed socio-demographic information and measures related to screen time, shopping habits, label use, nutritional knowledge and health status. The main content of the survey involved showing participants images of four food products designed according to the experimental condition (i.e., with or without FOP nutrition information and cartoon characters—see below). Participants were asked to rate all four food products based on a series of questions using a Likert scale from 1 to 10. After the rating of food products, participants were shown all four types of FOP nutrition information used in the study. They were asked about exposure to FOP nutrition information and were asked to rate each FOP nutrition information on believability, ease of understanding and perceived effectiveness. They were also asked to rank each FOP nutrition information on perceived effectiveness.

4.3.1 Presentation and Rating of Food Products

Each participant was randomized into one of the four experimental conditions (which will be described later) where they were shown an image of a food product and instructed to rate the product on appeal, nutritional quality, intention to buy and willingness to pay. For each rating, an image of a food product appeared on the screen and remained on the screen until the participant completed the rating. Participants continued viewing and rating food products until all four products were seen. Products were presented to participants in random order.

4.3.2 Selection of Food Products

To replicate food marketing practices in the real world, existing food products displaying the FOP nutrition information of interest (see below) were selected for the study. For example, for the *Sensible Solution* label, a food product that already has the *Sensible Solution* label on their package, such as Mr. Christie's Snak Paks soft baked cookies, was selected. The same process was applied to the remaining three types of FOP nutrition information.

The appearance of food products varied according to the experimental conditions. The food products were purposely chosen for their nutritional quality. Specifically, food products that were clearly unhealthy (e.g., potato chips) or healthy (e.g., fruits) were not considered because participants would have preconceived notions about their nutritional quality. As well, foods

that were clearly of high or low nutritional quality are unlikely to be affected by FOP nutrition information. For these reasons, food products that were "ambiguous" in their nutritional quality, which the general public might perceive as either healthy or unhealthy, were chosen for the study. It was hypothesized that FOP nutrition information might be most likely to enhance perceptions of nutritional quality for these foods.

A pilot study was conducted with 20 participants to help select food products for the main study. Three products for each of the four types of FOP nutrition information were selected according to the specified criteria (see below); therefore, a total of 12 products were used for the pilot study. Participants were asked to rate the three food products for each type of FOP nutrition information on nutritional quality using a Likert scale of 1 to 10 (1 being extremely unhealthy and 10 extremely healthy). Food products that were rated near the middle of the scale (neither unhealthy nor healthy) were selected for the main study. The products rated near the middle of the scale were used in the main study because they represented products with "ambiguous" nutritional quality. From the pilot study, four food products were selected for the main study. They were *Heinz spaghetti*, *Aunt Jemima pancakes*, *Kellogg's Fibre Plus granola bars* and *President's Choice (PC) bran bites*. In the main study, to test for the effect of different FOP nutrition information, the four types of FOP nutrition information were digitally added to each food product for experimental conditions 3 and 4 (see below).

Nutritional quality of food products was assessed using the "Tentative Proposed Standards for Marketing Foods to Children 2-17" by the Interagency Working Group on Food Marketing to Children (Interagency Working Group—FTC, CNPP, CDC, FDA, 2009). This Working Group was established by the Federal Trade Commission (FTC), the Commissioner of the Food and Drug Administration, the Director of the Centers for Disease Control and Prevention and the Secretary of Agriculture in the US with the goal of developing recommendations for standards for the marketing of food to children who are 17 years old or younger. The Tentative Proposed Nutrition Standards contain three proposed standards. Standard 1 categorized certain foods as "part of a healthful diet and may be marketed to children without meeting the requirements of Standards 2 and 3." These foods include 100-percent fruit and fruit juices, 100-percent

vegetables and vegetable juices with low-sodium content, 100-percent non-fat and low-fat milk and yogurt, 100-percent whole grains, and 100-percent water. Standard 2 requires "food marketed to children must provide a meaningful contribution to a healthful diet." In order to comply with Standard 2, food must contain significant amounts of fruits, vegetables, low-fat dairy, lean protein or whole grains, measured either by weight or serving size standards. Standard 3 mandates foods marketed to children must not contain more than limited amounts of saturated fat, trans-fat, sugar and sodium. For this study, standard 3 was used to assess food products of poor nutritional quality. Please see Appendix A for the full version of the Tentative Proposed Standards for Marketing Foods to Children 2-17.

In Standard 3 of the Tentative Proposed Standards for Marketing Foods to Children 2-17, it specifies that food marketed to children should contain no more than 13 grams of added sugars. Elliot (2008b) conducted a similar study in which the nutritional values of children's food products were assessed. Elliot noted that it was not possible to determine added sugars by weight from the nutrition facts table (the table only shows total sugars) as some food products also contain naturally occurring sugars (milk and fruit sugars). Elliot used an alternative method suggested by Harrison and Marske (2005) for calculating sugar content of food products. Harrison and Marske calculated the percentage of energy from sugars per 200-calorie serving. Any product that exceeds the 20% limit recommended by the American Heart Association was classified as of poor nutritional quality (Howard & Wylie-Rosett, 2002). This method of calculating sugars is helpful when information about sugars is only available from the nutrition facts table. The current study used the same formula to calculate sugar content of food products, which is described below.

The formula used to calculate the percentage of calorie from sugars per 200-calories serving:

*Percentage of calories from sugars per 200 calories serving = ((A * B) / C) * 100*

A = sugar content in food product per specified serving (in grams)
B = 4 calories / 1 gram sugar (conversion of grams to calories)
C = Total calories of food product per specified serving

4.4 Experimental Conditions

Table 2 shows the experimental conditions for the study. Packages were digitally altered according to the experimental condition. Other packaging elements such as fonts, colours, and brand names remained the same as the original packaging.

Participants were randomized to four experimental conditions:

1) Standard: Participants were shown images of food products that did not contain a cartoon character or a FOP nutrition information (original package).
2) Cartoon: Participants were shown images of food products that contained a cartoon character but no FOP nutrition information.
3) FOP nutrition information: Participants were shown images of food products that contained a FOP nutrition information but no cartoon character.
4) Cartoon & FOP nutrition information: Participants were shown images of food products that contained both a cartoon character and a FOP nutrition information.

Table 2: Experimental Conditions

		FOP Nutrition Information: NO	FOP Nutrition Information: YES
Cartoon Character: NO		Condition 1 	Condition 3 
	YES	Condition 2 	Condition 4 

Participants saw a total of four products: one product in each of the four conditions. In addition, participants were randomized in such a way that they viewed each product type (i.e., spaghetti, pancakes, granola bars and bran bites) only once.

Table 14 in Appendix B shows all 40 different images of food products that were shown to participants. For conditions 1 & 2, participants were randomly shown one image out of 4 possible images. Therefore, each image was viewed and rated by approximately 250 participants. In contrast, since conditions 3 & 4 contained four types of FOP nutrition

information, participants were randomly shown one image out of 16 possible images, for approximately 63 participants per image.

4.4.1 FOP Nutrition Information

Four types of FOP nutrition information were examined in the study: *Sensible Solution* by Kraft, *Given the Thumbs Up by Kids* by President's Choice, *Health Check* by Heart and Stroke Foundation and *Source of Fibre*, a nutrient content claim regulated by the government. These types of FOP nutrition information were selected because they appear on many children's food products. For example, *Sensible Solution* appears on food products such as peanut butter, jelly powder, pudding, crackers, and cookies. President's Choice *Given the Thumbs Up by Kids* appears exclusively on the President's Choice Mini Chef Line of food products for kids. These products are present in many major supermarkets across Canada. Similarly, *Health Check* and *Source of Fibre* are two types of FOP nutrition information that also appear on children's food products including cereals, granola bars, and pastas.

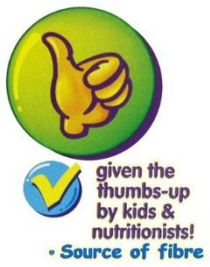
In addition, *Whole Grain* was originally selected for the study, but it was not defined as a nutrition claim by Health Canada, and therefore, it was removed from the study. It was replaced with *Health Check*, a FOP nutrition information from a non-profit organization.

A limitation to using these four types of FOP nutrition information is that they only allow selection of certain products for the study. The FOP nutrition information, *Sensible Solution* and *Given the Thumbs Up by Kids* appear only on a limited range of products. Likewise, *Health Check* and *Source of Fibre* appear mostly on grain products such as cereals, granola bars, pastas, and crackers. Other food products such as juices, dairy and frozen meals were omitted from the study because they contain other types of FOP nutrition information. Table 3 describes the four types of FOP nutrition information, the criteria used for eligibility and products that displayed them.

In addition to *Source of Fibre*, the other three types of FOP nutrition information also contained the nutrient content claim, "Source of Fibre," within or underneath their symbols. However, not all products were a source of fibre. According to the Canadian Food Inspection Agency criteria

for fibre, only *Kellogg's Fibre Plus granola bars* and *PC bran bites* met the criteria that would allow a "Source of Fibre" nutrient content claim.

Table 3: FOP Nutrition Information

FOP Nutrition Information	Description	Criteria for Eligibility	Products
1) Sensible Solution 	*Sensible Solution* is a front-of-package labelling system developed by Kraft's nutrition experts. The nutrition criteria are derived from Canada's Food Guide to Healthy Eating, Nutrition Recommendations for Canadians, and the Food and Drug Regulations (Kraft, 2010).	A product may be qualified for the label in one of two ways: 1) By providing beneficial nutrients such as protein, calcium or fibre/whole grain at nutritionally meaningful levels, or delivering a functional benefit, such as hydration, while staying within specific limits on calories, fat (including saturated and trans fat), sodium and sugar; 2) By meeting specifications for "reduced," "low" or "free" in calories, fat, saturated fat, sugar or sodium (Kraft, 2010).	The *Sensible Solution* labelling system has been applied to the following food product categories: desserts, peanut butter, beverages, salad dressings, cookies and crackers, cheese and dairy, mayonnaise and miracle whip, and convenient meal products. Many of these categories contain food products targeting children, for example, Kool-Aid within the beverage category also carries the *Sensible Solution* label.
2) Given the Thumbs Up by Kids 	*Given the Thumbs Up by Kids* is a symbol that appears on the package of President's Choice Mini Chefs Line of products, along with other types of nutrition information.	Although there are no specific nutrition criteria given by President's Choice, many of the products appear to be low in fat, sugar and sodium (from the nutrition facts table).	President's Choice Mini Chefs line of products: Funshines Biscuits, Mac-a-Cheezee, Raisin Rules!, Baby-Cut Carrots, Teddy Bear Arrowroot Biscuits, Zookies Animal Crackers, Cheddar Gators Baked Crackers (some of these products have been

FOP Nutrition Information	Description	Criteria for Eligibility	Products
			discontinued)
3) Health Check  Source of Fibre	*Health Check* is a front-of-package logo developed by the Heart and Stroke Foundation to help consumers choose healthier food products. The *Health Check* logo indicates that the product has been reviewed by the Heart and Stroke Foundation's registered dietitians and can contribute to an overall healthy diet (Heart and Stroke Foundation, 2011).	Food products with *Health Check* logo are evaluated by the Heart and Stroke Foundation's registered dietitians. To be eligible for *Health Check*, the product must meet nutrition criteria established by Health Check which is based on the recommendations in Canada's Food Guide (Heart and Stroke Foundation, 2011).	A variety of products.
4) Source of Fibre Source of Fibre	*Source of Fibre* is a nutrient content claim used by many food companies on their products to denote that their products contain a high amount of fibre. The claim is regulated by the Canadian Food Inspection Agency.	According to the Canadian Food Inspection Agency, a product can display *Source of Fibre* if it contains 2g or more of fibre per reference amount and serving of stated size (Canadian Food Inspection Agency, 2010).	A variety of products (mostly grain products)

4.4.2 Cartoon Characters

Four cartoon characters were used in the study: Buzz Lightyear (from Toy Story), SpongeBob SquarePants, Shrek and Winnie the Pooh. These cartoon characters were selected because they appear on popular children's TV shows and movies. In addition, all of these characters have appeared previously on children's food products. Table 4 describes these cartoon characters.

Table 4: Cartoon Characters

Cartoon Characters	Description
1) *Buzz Lightyear* 	*Buzz Lightyear* is a character from the popular children's animated film series, Toy story, which has spawned three featured films to date. It was produced by Pixar animation studios.
2) *SpongeBob SquarePants* 	*SpongeBob SquarePants* is the main character from the popular children's animated cartoon series of the same name. It airs on the Nickelodeon cable television network in the US and YTV in Canada.

3) *Shrek*

Shrek is the main character from the very successful children's animated film series, Shrek. It was produced by Dreamworks Animation and has spawned four featured films to date.

4) *Winnie the Pooh*

Winnie the Pooh is a character from the Walt Disney children's animated cartoon series of the same name. It has become one of Walt Disney's most successful franchises worldwide and spawned a number of featured films and animated series.

4.5 Measures

4.5.1 Eligibility Assessment and Socio-demographic Information

To determine eligibility for the study, participants were asked for their age, whether they have any children ages 4-10, and whether they are the primary shopper of their household. Participants who were 18 and over, had at least one child ages 4-10 and the primary shopper of their household were included in the study and prompted to continue on with the survey. Those that did not meet the criteria were excluded from the study.

Socio-demographic measures included gender, age group, number of children ages 4-10, BMI class, education, income, and ethnicity. Participants were asked for their height and weight and their BMI was calculated using the equation BMI = weight (kg) / height $(m)^2$. Participants were then categorized into BMI class according to the World Health Organization's BMI classification (World Health Organization, 2011). Education was determined by response to the survey item, "What is the highest level of education you have completed?", with options ranging from "grade school or some high school" to "university degree or certificate above bachelor's degree". Income was determined by response to the survey item, "What is your best estimate of the total household income received by all household members, from all sources, before taxes and deductions, in the past 12 months?", with options ranging from "less than $5,000" to "$150,000 and over". Ethnicity was assessed by asking, "People living in Canada come from many different cultural and racial backgrounds. Are you…". Participants were presented with twelve ethnicity options to choose from, in addition to "other".

4.5.2 Screen Time and Shopping Habits

Participants were also asked about the amount of time their children spent in front of a screen (TV or computer) and their shopping habits. For shopping habits, participants were asked about their food shopping frequency, how often they bring their children to the store, how often their children asked for food products and whether they buy the products that their children requested.

4.5.3 Label Use, Nutritional Knowledge and Health Status

Participants were also asked whether they look for nutrition information on food package when shopping, what types of nutrition information they look for and whether they perceived themselves as being knowledgeable in health and nutrition issues. Moreover, they were also asked to rate their general health and whether they have any medical condition.

4.5.4 Children's Food Product Ratings

Participants were asked to rate each food product on appeal, nutritional quality, intention to buy and willingness to pay. Responses for appeal, nutritional quality and intention to buy were recorded using a 1-10 Likert scale. For willingness to pay, participants were given 7 price ranges to choose from.

1) Appeal was determined by asking, "Do you think your child (children) would like this product?", with responses ranging from "1 - Not at all" to "10 - Definitely."
2) Nutritional Quality was determined by asking, "Do you think this product would be nutritious for your child (children)?", with responses ranging from "1- Not at all" to "10 - Definitely."
3) Intention to Buy was determined by asking, "Would you buy this product for your child (children)?", with responses ranging from "1 - Not at all" to "10 - Definitely."
4) Willingness to Pay was determined by asking, "What is the highest amount you would be willing to pay for this product?", with responses ranging from "$1.50 or less" to "More than $5.50." Participants were also allowed to choose "I would not purchase this product regardless of price" as their response.

4.5.5 FOP Nutrition Information Ratings

After the food product ratings, participants were randomly shown four types of FOP nutrition information used in the study, one at a time. For each type of FOP nutrition information, they were asked whether they have seen the FOP nutrition information (exposure) and were asked to rate it on believability, ease of understanding, and perceived effectiveness in choosing healthy foods using a 1-10 Likert scale. Lastly, they were shown four types of FOP nutrition

information all at once and were asked to rank each type of FOP nutrition information on effectiveness by choosing the one they think is the most effective first and the least effective last.

1) Exposure was determined by asking, “Have you seen this type of nutrition information before this study?”, with “yes” or “no” as response options.
2) Believability was determine by asking, “In your opinion, is this nutrition information believable?”, with responses ranging from “1 - Not at all” to “10 - Definitely.”
3) Ease of Understanding was determined by asking, “In your opinion, is this nutrition information easy to understand?”, with responses ranging from “1- Not at all” to “10 - Definitely.”
4) Perceived Effectiveness was determined by asking, “In your opinion, would this type of nutrition information help you choose healthier foods?”, with responses ranging from “1- Not at all” to “10 - Definitely.”
5) Ranking of Effectiveness was determined by asking, “Overall, which type of nutrition information do you think would be most effective in helping people to choose healthier foods?” Participants were shown all four types of FOP nutrition information at the same time and were prompted to choose the most effective one first. Once the most effective FOP nutrition information was chosen, they were asked, “What is the next most effective type of nutrition information” for the remaining three types of FOP nutrition information. The process is repeated until all four types of FOP nutrition information were ranked (chosen).

Please see Appendix C for full version of the survey questionnaire.

5.0 ANALYSIS

5.1 Hypotheses

The specific hypotheses were:

1) Appeal would be rated higher for food products with cartoon characters and/or FOP nutrition information compared to those without cartoon characters and/or FOP nutrition information.
2) Nutritional quality would be rated higher for food products with cartoon characters and/or FOP nutrition information compared to those without cartoon characters and/or FOP nutrition information.
3) Intention to buy would be rated higher for food products with cartoon characters and/or FOP nutrition information compared to those without cartoon characters and/or FOP nutrition information.
4) Willingness to pay would be rated higher for food products with cartoon characters and/or FOP nutrition information compared to those without cartoon characters and/or FOP nutrition information.
5) *Health Check* and *Source of Fibre* would be rated higher on believability, ease of understanding, perceived effectiveness compared to *Sensible Solution* and *Given the Thumbs up by Kids*.
6) *Health Check* and *Source of Fibre* would be ranked higher on effectiveness compared to *Sensible Solution* and *Given the Thumbs up by Kids*.
7) *Given the Thumbs up by Kids* would be rated as the least seen prior to the study compared to *Health Check*, *Source of Fibre* and *Sensible Solution*.

5.2 Statistical Analysis

5.2.1 Descriptive Statistics and Recoding

All analyses were conducted using SAS 9.2. Descriptive statistics were generated to give sample characteristics. Although 1,001 parents were recruited, 104 parents have missing data and

therefore, they were removed from the study. As a result, 897 parents were included in the analysis.

Randomization Test

Because of the research design, in which all participants are included in each of the four conditions across the four product types, traditional tests to test the effectiveness of randomization is not appropriate. Instead, a representative test was undertaken within condition 1 to test whether randomization to each of the four product types resulted in similar socio-demographic profiles. A chi-square test was performed to examine gender, age group, number of children aged 4-10, BMI class, education, income and ethnicity. The results (not shown) indicated that there were no significant differences among participants allocated to see each product in condition 1, suggesting that randomization was successful.

Recoding of Variables

Some variables were recoded before the analysis. Age was recoded into three age groups: 18-34, 35-44 and 45 and over. Number of children ages 4-10 was recoded into two categories: one child and two or more children. Education was recoded into three categories: low, medium and high. Likewise, income was also recoded into three categories: low, medium and high. Ethnicity was recoded into two categories: white and other ethnicity.

Frequency of shopping was recoded into four categories: 1 time per month or less, 2-3 times per month, 1 time per week and more than 1 time per week. Nutrition information sought was recoded into three categories: none, FOP nutrition information and other nutrition information.

Please refer to Appendix C for the original questions and response options.

5.2.2 Linear Mixed Model

Linear mixed models were conducted to examine differences between the four experimental conditions, as well as to examine the influence of the covariates and other predictors. Linear mixed modelling is used to analyze hierarchical or repeated observations. When observations

are grouped, linear mixed model allows one to account for the variability between groups (random effects) which would not have been possible if general linear modelling was used.

In this study, the participants were assigned to view one product in each of the four experimental conditions, in random order. Since each participant saw all four conditions, the study's data structure is composed of four sets of repeated observations per participant. In other words, the observations were grouped by participants. The random intercept model, a subset of linear mixed models, was used to analyze the study's data. The random intercept model allowed the intercepts of the outcome variables to be modeled as random effects of the grouping variable (participants); the main effect variables and other covariates and predictors were modeled as fixed effects.

There were two main sets of outcome measures in the study: Children's food product rating and FOP nutrition information ratings. Product ratings have four measures while FOP nutrition information ratings have five:

1. Children's Food Product Ratings: Appeal, nutritional quality, intention to buy, and willingness to pay.
2. FOP Nutrition Information Ratings: Exposure, believability, understanding, perceived effectiveness, and comparative ranking of effectiveness.

With the exception of exposure, all outcome variables were continuous. Exposure is a binary variable with value of either yes or no.

5.2.3 Children's Food Product Rating Model

The main interest of the study was to examine whether the addition of cartoon characters and FOP nutrition information to the product package influenced the rating of the food products.

The model for product rating outcomes was run in four steps:

1) Main effects
2) Main effects and FOP nutrition information effect
3) Main effects, FOP nutrition information effect and covariates

4) Main effects, FOP nutrition information effect, covariates and other predictors

The model started with the main effect variables. Then the FOP nutrition information variable was added in the next step, followed by the covariates and other predictors in steps 3 and 4.

The following paragraph describes the steps in more details.

Step 1: Main effects

The first step included only the main effects of interest. The main effect variables were condition, product type and order. Condition was the main variable of interest and contained 4 levels (condition 1 - standard packaging, condition 2 - packaging with cartoon character only, condition 3 - packaging with FOP nutrition information only, condition 4 - packaging with both cartoon character and FOP nutrition information). Product type is the type of food product. Four different products were used in the study (*Heinz spaghetti*, *Aunt Jemima pancakes*, *Kellogg's Fibre Plus granola bars* and *PC bran bites*). Finally, order is the order that the products were seen by the participant which was randomized across participants.

Step 2: FOP Nutrition Information Effect

In the second step, the effect of FOP nutrition information on the product rating outcomes was examined. Four different types of FOP nutrition information were used in the study: *Sensible Solution*, *Given the Thumbs Up by Kids*, *Health Check* and *Source of Fibre*. FOP Nutrition information type was added as a fixed effect to model 1 with the main effect variables (see above). The condition variable only included conditions 3 and 4 since FOP nutrition information only appeared in conditions 3 and 4.

Step 3: Main Effects, FOP Nutrition Information Effect and Covariates

For the third step, the covariates were added to the main effect model. The covariates included age group, gender, number of children ages 4-10, BMI class, education, income and ethnicity. The covariates were also modeled as fixed effects. In addition, each covariate was crossed with the main effect variable, condition, to test for two-way interactions. All covariates were retained in the model even if they were not significant at $p = 0.05$ level. Since the covariates

were basic important socio-demographic factors, it was imperative that they were included in the model.

Step 4: Main Effects, FOP Nutrition Information Effect, Covariates and Other Predictors

The survey also included information on the participant's children screen time as well as the participant's shopping habits, label use, nutritional knowledge and health status. Thus, it was of interest to examine whether these variables were significant predictors of the outcome variables. In this step, screen time, shopping habits, label use, nutritional knowledge and health status variables were added to the model to test for their significance.

5.2.4 FOP Nutrition Information Rating Model

The secondary interest of the study was to examine whether there was variability among the four types of FOP nutrition information used in the study. FOP nutrition information rating model was run in three steps. Exposure was not included in the model. Instead, frequency of exposure was generated to give proportions of participants that had seen each type of FOP nutrition information before the study.

Step 1: Main effects

The main effects variables were FOP nutrition information type and order. They were modeled as fixed effects. There were four types of FOP nutrition information used in the study (see above). The order variable referred to the order that the four types of FOP nutrition information were seen by the subject.

Step 2: Main effects and Covariates

Likewise, the same covariates (in product rating model) were added to the main effect model for FOP nutrition information rating to test for significant effect. Interaction effect was examined by crossing the covariates with the FOP nutrition information type variable. All covariates were retained in the model even if they failed the significant test (at 0.05 levels) since they were basic important social demographic information.

Step 3: Other Predictors

In this step, other predictors such as screen time, shopping habits, label use, nutritional knowledge and health status variables were added to the model to examine for significant effect.

5.3 Sample Size Calculation

A sample size calculation was conducted prior to the study to determine levels of statistical power to detect a significant difference between experimental conditions for key outcomes. For outcome measures using 10-point Likert scale, the sample size of 1,000 participants (250 in each of the four conditions) was estimated to provide 80% power to detect a 0.625 difference in means between groups assuming a standard deviation of 2.5 (α=0.05, 2-tailed test). This standard deviation was derived from studies with very similar rating scales conducted with cigarette packaging (Hammond, Thrasher, Reid, Driezen, Boudreau, & Arillo-Santillan, in press). For analyses testing differences between type of FOP nutrition information featured in conditions 1 and 2, sample sizes of 63 participants who view each type of FOP nutrition information provided 80% power to detect a 1.28 difference in means between groups.

6.0 RESULTS

6.1 Sample Characteristics

Table 5 shows the sample characteristics of the parents. The sample was approximately three quarters female and over three quarters white. The sample also has high proportions of parents with higher education.

Table 5: Sample Characteristics of Parents (N = 897)

	%	(n)
Gender		
Male	25.1%	(225)
Female	74.9%	(672)
Age Group		
18-34	33.0%	(296)
35-44	50.3%	(451)
45 and over	16.7%	(150)
Number of Children ages 4-10		
1 Child	62.8%	(563)
2 Children or more	37.2%	(334)
BMI Class		
Underweight	2.9%	(26)
Normal	46.8%	(420)
Overweight	29.7%	(266)
Obese	20.6%	(185)
Education		
Low (High school or less)	24.8%	(222)
Medium (Certificate or diploma from university, college, vocational school or apprenticeship training)	41.2%	(370)
High (Bachelor's degree or above)	34.0%	(305)
Income		
Low ($40,000 or less)	24.1%	(216)
Medium ($40,000 or more but less than $80,000)	39.1%	(351)
High ($80,000 and over)	36.8%	(330)
Ethnicity		

White	77.3%	(693)
Other Ethnicity	22.7%	(204)

6.2 Product Rating Outcomes

Parents were shown four different food products, one in each of four different conditions. They were asked to rate each product on appeal, nutritional quality, intention to buy and willingness to pay. Linear mixed model was used to analyze product rating outcomes. The means of product rating outcomes were adjusted for socio-demographic factors and measures related to screen time, shopping habits, label use, nutritional knowledge and health status.

6.2.1 Appeal

Table 6.1 shows the adjusted means for the rating of appeal by condition. Table 6.2 shows the outcomes of the linear mixed model for appeal.

Table 6.1: Adjusted Means for Appeal (N=897)

Condition	Adjusted Mean	Standard Error
Standard	6.21	0.41
Cartoon	6.53	0.41
FOP Nutrition Information	6.24	0.41
Cartoon & FOP nutrition information	6.57	0.41

Table 6.2: Linear Mixed Model Outcomes for Appeal (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
Condition	**3**	**5.31**	**0.0012**
Product	**3**	**152.73**	**<0.0001**
Order	3	1.92	0.12
Gender	1	3.72	0.054
Age Group	2	0.96	0.38
Number of Children (ages 4-10)	**1**	**4.16**	**0.042**
BMI Class	3	2.61	0.050
Education	2	0.83	0.44
Income	2	1.80	0.17

Ethnicity	1	3.22	0.073
Screen Time	5	0.78	0.56
Shopping Frequency	**3**	**3.81**	**0.0097**
Bring Children to the Store	**4**	**3.62**	**0.0060**
Children ask for Food Products	**4**	**4.28**	**0.0019**
Buy Food Products for Children	3	1.97	0.12
Children's Influence on Purchase Decision	4	0.31	0.87
Label Use	**4**	**2.66**	**0.031**
Nutrition Information Sought	**2**	**4.66**	**0.0096**
Perceived Nutritional Knowledge	4	1.80	0.13
General Health	**4**	**2.92**	**0.020**
Medical Conditions	**1**	**4.05**	**0.044**

Table 15 in Appendix D shows contrasts for all variables in the linear mixed model for appeal. From table 15 in Appendix D, in comparison to products in the *Standard* condition, products in both the *Cartoon* and the *Cartoon & FOP Nutrition Information* conditions were rated significantly higher on appeal (0.32, p=0.0054; 0.36, p=0.0019). When compared to products in the *Cartoon* condition, products in the *FOP Nutrition Information* condition were rated significantly lower on appeal (-0.28, p=0.013). On the other hand, products in the *Cartoon & FOP Nutrition Information* condition were rated significantly higher on appeal when compared to products in the *FOP Nutrition Information* condition (0.32, p=0.0048).

The rating on appeal was significantly different across types of products. On average, *Aunt Jemima pancakes* was rated the highest on appeal, followed by *Kellogg's Fibre Plus granola bars*, *Heinz spaghetti* and *PC Bran Bites* respectively. There was no significant difference based on the order in which products were viewed.

With regards to socio-demographic factors, parents with two or more children between ages 4-10 rated products significantly higher on appeal than those with only one child (0.24, p=0.042). Overweight and obese parents rated products significantly lower on appeal than underweight parents (-0.73; p=0.033; -0.71, p=0.042). When compared to parents with normal BMI, overweight parents also rated products significantly lower on appeal (-0.26, p=0.049).

When examining shopping habits, parents who shopped 2-3 times per month, 1 time per week or more than 1 time per week rated products significantly lower on appeal than those who

shopped 1 time per month or less (-1.30, p=0.024; -1.58, p=0.0062; -1.61, p=0.0051). Similarly, parents who shopped more than 1 time per week rated products significantly lower on appeal than those who shopped 2-3 times per month (-0.31, p=0.041).

In addition, parents who reported that they "almost never," "sometimes," "usually" or "always" bring their children to the store rated products significantly higher on appeal than those who reported that they "never" bring their children to the store (2.76, p=0.0052; 3.00, p=0.0021; 3.02, p=0.002; 3.30, p=0.0008). Also, parents who reported that they "always" bring their children to the store rated products significantly higher on appeal than those who reported that they "almost never" bring their children to the store (0.54; p=0.038).

Furthermore, parents whose children "always" ask for food products rated products significantly higher on appeal compared to those whose children "almost never" ask for food products (0.61, p=0.019). Likewise, parents whose children "usually" or "always" ask for food products rated products significantly higher on appeal than those whose children "sometimes" ask for food products (0.33, p=0.015; 0.60, p<0.0001).

As for label use, parents who reported that they "always" use food labels rated products significantly higher on appeal than those who reported that they "almost never" or "usually" use food labels (0.59, p=0.028; 0.44, p=0.0028). Parents who reported that they sought FOP nutrition information on food products gave significantly higher rating on appeal than those who reported that they did not seek any nutrition information (0.92, p=0.024). In contrast, parents who sought other nutrition information (including nutrition facts table) rated products significantly lower on appeal compared to those who reported that they sought FOP nutrition information (-0.28, p=0.015).

Parents who rated their health as very good gave products significantly higher rating on appeal than those who rated their health as fair or good (0.54, p=0.011; 0.37, p=0.0048). On the other hand, parents who reported having a medical condition also rated products significantly higher on appeal than those who did not report any medical condition (0.30, p=0.044).

6.2.2 Nutritional Quality

Table 7.1 shows the adjusted means for the rating of nutritional quality by condition. Table 7.2 shows the outcomes of the linear mixed model for nutritional quality.

Table 7.1: Adjusted Means for Nutritional Quality (N=897)

Condition	Adjusted Mean	Standard Error
Standard	6.13	0.39
Cartoon	6.00	0.39
FOP Nutrition Information	6.35	0.39
Cartoon & FOP nutrition information	6.29	0.39

Table 7.2: Linear Mixed Model Outcomes for Nutritional Quality (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
Condition	**3**	**8.02**	**<0.0001**
Product	**3**	**459.49**	**<0.0001**
Order	3	1.26	0.29
Gender	1	0.04	0.84
Age Group	2	1.49	0.22
Number of Children (ages 4-10)	1	0.09	0.76
BMI Class	3	0.52	0.67
Education	2	1.55	0.21
Income	2	1.33	0.27
Ethnicity	1	1.30	0.26
Screen Time	**5**	**2.94**	**0.012**
Shopping Frequency	**3**	**3.81**	**0.0097**
Bring Children to the Store	4	0.97	0.43
Children ask for Food Products	**4**	**2.44**	**0.045**
Buy Food Products for Children	**3**	**11.94**	**<0.0001**
Children's Influence on Purchase Decision	**4**	**3.20**	**0.013**
Label Use	4	2.31	0.056
Nutrition Information Sought	**2**	**10.78**	**<0.0001**
Perceived Nutritional Knowledge	4	1.99	0.093
General Health	4	1.99	0.094
Medical Conditions	1	2.50	0.11

Table 16 in Appendix D shows contrasts for all variables in the linear mixed model for nutritional quality. From table 16 in Appendix D, in comparison to products in the *Standard* condition, products in the *FOP Nutrition Information* and the *Cartoon & FOP Nutrition Information* conditions were rated significantly higher on nutritional quality (0.22, p=0.0053; 0.16, p=0.044). Similarly, products in the *FOP Nutrition Information* and the *Cartoon & FOP Nutrition Information* conditions were rated significantly higher on nutritional quality than products in the *Cartoon* condition (0.35, p=<0.0001; 0.29, p=0.0003).

The rating on nutritional quality was significantly different across types of products. Overall, *PC bran bites* was rated the highest on nutritional quality, followed by *Kellogg's Fibre Plus granola bars*, *Aunt Jemima pancakes* and *Heinz spaghetti* respectively. There was no significant difference observed across the order of product seen or socio-demographic factors.

For screen time, parents who reported that their children spent "1-2 hours," "3-4 hours," "5-6 hours," or "7+ hours" per day in front of a screen rated products significantly higher on nutritional quality compared to parents who reported that their children spent "< 1 hour" per day in front of a screen (0.70, p=0.0003; 0.70, p=0.0004; 0.69, p=0.0054; 0.67, p=0.018).

With regards to shopping habits, parents who shopped one time or more than one time per week rated products significantly lower on nutritional quality than those who shopped 2-3 times per month (-0.37, p=0.012; -0.41, p=0.0052).

Parents who reported that their children "always" ask for food products rated products significantly higher on nutritional quality than those who reported that their children "almost never" or "sometimes" ask for food products (0.61, p=0.015; 0.39, p=0.0073). Moreover, parents who reported that they "sometimes", "usually" or "always" buy food products that their children requested rated products significantly higher on nutritional quality compared to those who reported that they "almost never" buy food products that their children requested (0.75, p=0.0012; 1.35, p<0.0001; 1.65, p<0.0001). In comparison to parents who reported that they "sometimes" buy food products that their children requested, those who reported that they "usually" or "always" buy food products that their children requested rated products significantly higher on nutritional quality (0.60, p<0.0001; 0.90, p=0.003).

Parents also rated products significantly higher on nutritional quality if they reported that their children "always" influence their purchase decision compared to those who reported that their children "almost never," "sometimes," or "usually" influence their purchase decision (1.02, p=0.0006; 0.73, p=0.0065; 0.64, p=0.019).

Parents who reported seeking FOP nutrition information rated products significantly higher on nutritional quality than those who reported that they did not seek any nutrition information (1.04, p=0.0081). On the other hand, parents who reported seeking other nutrition information (including nutrition facts table) rated products significantly lower on nutritional quality than those who reported seeking FOP nutrition information (-0.47, p<0.0001).

There was an interaction effect between condition and education. In the *Standard* and the *FOP Nutrition Information* conditions, parents in the high education level category rated products significantly lower on nutritional quality than parents in the medium and the low education level categories. In the *Cartoon* condition, parents in the high education level category rated products significantly lower on nutritional quality than parents in the medium education level category.

6.2.3 Intention to Buy

Table 8.1 shows the adjusted means for the rating of intention to buy by condition. Table 8.2 shows the outcomes of the linear mixed model for intention to buy.

Table 8.1: Adjusted Means for Intention to Buy (N=897)

Condition	Adjusted Mean	Standard Error
Standard	5.78	0.45
Cartoon	5.81	0.45
FOP Nutrition Information	5.97	0.45
Cartoon & FOP nutrition information	5.98	0.45

Table 8.2: Linear Mixed Model Outcomes for Intention to Buy (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value

Condition	3	1.93	0.12
Product	**3**	**101.10**	**<0.0001**
Order	3	1.37	0.25
Gender	1	2.99	0.084
Age Group	2	0.60	0.55
Number of Children (ages 4-10)	1	0.00	0.97
BMI Class	3	0.70	0.55
Education	**2**	**4.08**	**0.017**
Income	2	2.55	0.079
Ethnicity	1	1.78	0.18
Screen Time	**5**	**3.10**	**0.0085**
Shopping Frequency	3	2.38	0.068
Bring Children to the Store	4	1.61	0.17
Children ask for Food Products	**4**	**5.46**	**0.0002**
Buy Food Products for Children	**3**	**13.79**	**<0.0001**
Children's Influence on Purchase Decision	4	1.08	0.36
Label Use	4	1.35	0.25
Nutrition Information Sought	**2**	**10.62**	**<0.0001**
Perceived Nutritional Knowledge	**4**	**3.04**	**0.016**
General Health	4	1.39	0.23
Medical Conditions	1	3.17	0.075

Table 17 in Appendix D shows contrasts for all variables in the linear mixed model for intention to buy. There was no observed significant difference across conditions for the rating of intention to buy.

Not surprisingly, intention to buy was rated significantly different across types of products. On average, *Kellogg's Fibre Plus granola bars* was rated the highest on intention to buy, followed by *Aunt Jemima pancakes*, *PC bran bites* and *Heinz spaghetti* respectively. There was no significant difference observed for the rating of intention to buy across the order of product seen.

For socio-demographic factors, parents in the high education level category rated products significantly lower on intention to buy than those in the medium education level category (-0.42, p=0.0045).

As for screen time, parents who reported that their children spent “1-2 hours,” “3-4 hours,” “5-6 hours,” or “7+ hours” per day in front of a screen rated products significantly higher on intention to buy than those who reported that their children spent “<1 hour” per day in front of a screen (0.80, p=0.0002; 0.72, p=0.0014; 0.86, p=0.0026; 0.90, p=0.0051).

Parents who reported that their children “usually” or “always” ask for food products rated products significantly higher on intention to buy than those who reported that their children “almost never” ask for food products (0.78, p=0.0048; 1.06, p=0.0002). Similarly, parents who reported that their children “usually” or “always” ask for food products rated products significantly higher on intention to buy than those who reported that their children “sometimes” ask for food products (0.38, p=0.012; 0.65, p=0.0001).

Also, parents who reported that they “always” buy food products that their children requested rated products significantly higher on intention to buy than those who reported that they “almost never,” “sometimes,” or “usually” buy food products that their children requested (2.31, p<0.0001; 1.59, p<0.0001; 0.92, p=0.0084). Parents who reported that they “usually” buy food products that their children requested gave products significantly higher rating on intention to buy compared to those who reported that they “almost never,” or “sometimes” buy food products that their children requested (1.39, p<0.0001; 0.67, p<0.0001). Similarly, parents who reported that they “sometimes” buy food products that their children requested rated products significantly higher on intention to buy than those who reported that they “almost never” buy food products that their children requested (0.72, p=0.0066).

With regards to nutrition information sought, parents who sought other nutrition information (including nutrition facts table) rated products significantly lower on intention to buy than those who sought FOP nutrition information (-0.57, p<0.0001).

As for perceived nutrition knowledge, parents who were “neutral or had no opinion”, or “agreed somewhat” that they are knowledgeable about health and nutrition issues rated products significantly higher on intention to buy than those who “strongly disagreed” (1.06, p=0.018; 1.02, p=0.021). In line with this finding, parents who “strongly agreed” that they are knowledgeable about health and nutrition issues rated products significantly lower on intention

to buy than those who were “neutral or had no opinion”, or “agreed somewhat” (-0.47, p=0.035; -0.43, p=0.0094).

There was an interaction effect between condition and gender. In the *Standard* condition, male parents rated products significantly higher on intention to buy than female parents.

6.2.4 Willingness to Pay

Table 9.1 shows the adjusted means for the rating of willingness to pay. Table 9.2 shows the outcomes of the linear mixed model for willingness to pay.

Table 9.1: Adjusted Means for Willingness to Pay (N=897)

Condition	Adjusted Mean	Standard Error
Standard	2.99	0.18
Cartoon	2.99	0.18
FOP Nutrition Information	3.05	0.18
Cartoon & FOP nutrition information	3.02	0.18

Table 9.2: Linear Mixed Model Outcomes for Willingness to Pay (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
Condition	3	1.12	0.34
Product	**3**	**565.33**	**<0.0001**
Order	3	2.60	0.051
Gender	**1**	**16.10**	**<0.0001**
Age Group	**2**	**4.32**	**0.014**
Number of Children (ages 4-10)	1	1.70	0.19
BMI Class	**3**	**4.48**	**0.0038**
Education	2	1.80	0.17
Income	**2**	**4.19**	**0.015**
Ethnicity	1	0.64	0.42
Screen Time	**5**	**2.58**	**0.025**
Shopping Frequency	3	0.54	0.66
Bring Children to the Store	4	0.51	0.73
Children ask for Food Products	4	1.58	0.18
Buy Food Products for Children	**3**	**5.04**	**0.0017**
Children’s Influence on Purchase Decision	**4**	**3.63**	**0.0059**

Label Use	4	1.84	0.12
Nutrition Information Sought	2	0.22	0.81
Perceived Nutritional Knowledge	4	1.16	0.33
General Health	4	0.87	0.48
Medical Conditions	1	2.58	0.11

Table 18 in Appendix D shows contrasts for all variables in the linear mixed model for willingness to pay. There was no significant difference observed for the rating of willingness to pay across conditions.

In contrast, willingness to pay was rated significantly different across types of products. Overall, *Aunt Jemima Pancakes* was rated the highest on willingness to pay, followed by *Kellogg's Fibre Plus granola bars*, *PC bran bites* and *Heinz spaghetti* respectively. There was no significant difference observed for the rating of willingness to pay across the order of product seen.

Significant differences were also observed for socio-demographic factors. Male parents rated products significantly higher on willingness to pay than female parents (0.24, $p<0.0001$). Parents in the 35-44 and 45 and over age groups rated products significantly lower on willingness to pay than those in the 18-34 age group (-0.14, $p=0.017$; -0.20, $p=0.0084$). Parents in the normal, overweight and obese categories for BMI class rated products significantly lower on willingness to pay than those in the underweight category (-0.47, $p=0.0016$; -0.46, $p=0.0029$; -0.57, $p=0.0003$). Moreover, parents in the high income level category rated products significantly higher on willingness to pay than those in the medium income level category (0.17, $p=0.0042$).

For screen time, parents who reported that their children spent "3-4 hours" and "7+ hours" per day in front of a screen rated products significantly higher on willingness to pay than those who reported that their children spent "<1 hour" per day in front of a screen (0.22, $p=0.017$; 0.43, $p=0.001$). In addition, parents who reported that their children spent "7+ hours" per day in front of a screen rated products significant higher on willingness to pay compared to those who reported that their children spent "1-2 hours" per day in front of a screen (0.29, $p=0.009$).

When examining shopping habits, parents who reported that they "sometimes," "usually," or "always" buy food products that their children requested rated products significantly higher on willingness to pay than those who reported they "almost never" buy food products that their children requested (0.21, p=0.048; 0.38, p=0.0016; 0.54, p=0.0019). Additionally, parents who reported that they "usually" or "always" buy food products that their children requested gave products significantly higher rating on willingness to pay than those who reported that they "sometimes" buy food products that their children requested (0.17, p=0.0084; 0.33, p=0.019).

Parents who reported that their children "sometimes," "usually," or "always" influence their purchase decision rated products significantly higher on willingness to pay than those who reported that their children "never" influence their purchase decision (0.37, p=0.041; 0.42, p=0.027; 0.44, p=0.042). Similarly, parents who reported that their children "sometimes," "usually," or "always" influence their purchase decision rated products significantly higher on willingness to pay than those who reported that their children "almost never" influence their purchase decision (0.22, p=0.0018; 0.27, p=0.0024; 0.29, p=0.032).

6.2.5 Nutrition Information Type

Nutrition information type was included as a predictor in the linear mixed model for all product rating outcomes. It was not found to be significant and thus, was not included in the final model for product rating outcomes.

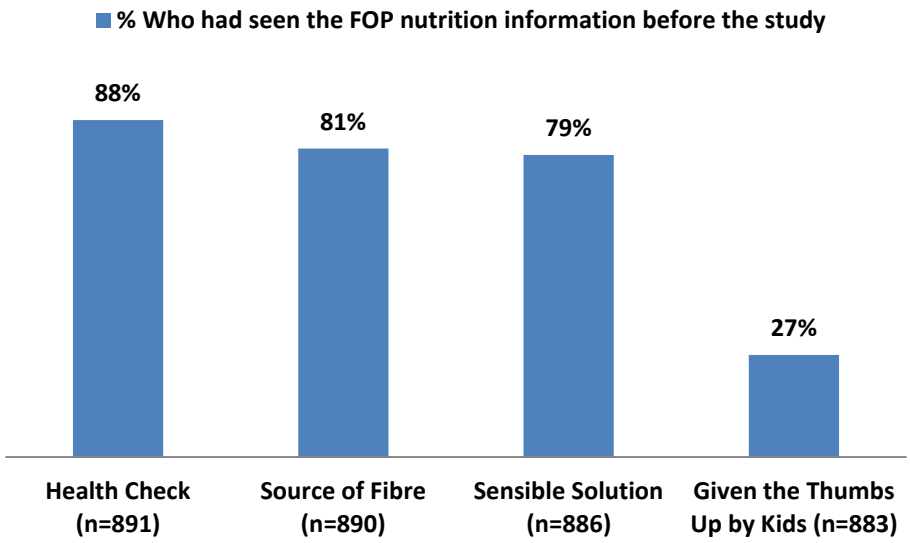
6.3 FOP Nutrition Information Ratings

Parents were also shown four different types of FOP nutrition information used in the study. They were asked to rate each FOP nutrition information on believability, ease of understanding, and perceived effectiveness. They were also asked to rank each FOP nutrition information on perceived effectiveness. Linear mixed model was used to analyze FOP nutrition information rating outcomes. The means of FOP nutrition information rating outcomes were adjusted for socio-demographic factors and measures related to screen time, shopping habits, label use, nutritional knowledge and health status.

6.3.1 Exposure to FOP Nutrition Information

Figure 2 displays the proportions of parents who had seen the four types of FOP nutrition information before the study.

Figure 2: Exposure to FOP Nutrition Information[1]



Overall, *Health Check* was the most seen FOP nutrition information, followed by *Source of Fibre*, *Sensible Solution* and *Given the Thumbs Up by Kids* respectively. Compared to the other three types of FOP nutrition information, *Given the Thumbs Up by Kids* was disproportionately the least seen at 27%.

[1] The sample size was not equal to 897 due to missing data on exposure to FOP nutrition information.

6.3.2 Believability

Table 10.1 shows the adjusted means for the rating of believability by FOP nutrition information type. Table 10.2 shows the outcomes of the linear mixed model for believability.

Table 10.1: Adjusted Means for Believability (N=897)

FOP Nutrition Information Type	Adjusted Mean	Standard Error
Source of Fibre	6.31	0.40
Health Check	7.15	0.40
Sensible Solution	5.96	0.40
Given the Thumbs Up by Kids	5.46	0.40

Table 10.2: Linear Mixed Model Outcomes for Believability (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
FOP Nutrition Information Type	**3**	**191.80**	**<0.0001**
Order	3	0.60	0.61
Gender	1	3.14	0.076
Age Group	2	1.58	0.21
Number of Children (ages 4-10)	1	0.55	0.46
BMI Class	3	0.45	0.72
Education	2	0.73	0.48
Income	2	1.03	0.36
Ethnicity	1	0.91	0.34
Screen Time	5	1.71	0.13
Shopping Frequency	3	1.38	0.25
Bring Children to the Store	4	0.61	0.65
Children ask for Food Products	4	1.36	0.25
Buy Food Products for Children	**3**	**7.79**	**<0.0001**
Children's Influence on Purchase Decision	4	1.22	0.30
Label Use	4	1.50	0.20
Nutrition Information Sought	**2**	**22.76**	**<0.0001**
Perceived Nutritional Knowledge	4	1.70	0.15
General Health	4	1.14	0.34
Medical Conditions	1	0.17	0.68

Table 19 in Appendix D shows contrasts for all variables in the linear mixed model for believability. The rating for believability was significantly different across types of FOP nutrition

information. Overall, *Health check* was rated the highest on believability, followed by *Source of Fibre*, *Sensible Solution* and *Given the Thumbs Up by Kids* respectively. There was no significant difference observed for the rating of believability across the order of FOP nutrition information seen or social-demographic factors.

Parents who reported that they "sometimes", "usually" or "always" buy food products that their children requested rated FOP nutrition information significantly higher on believability compared to those who reported that they "almost never" buy food products that their children requested (0.68, $p=0.0044$; 1.15, $p<0.0001$; 1.44, $p=0.0002$). In addition, parents who reported that they "usually" or "always" buy food products that their children requested rated FOP nutrition information significantly higher on believability than those who reported that they "sometimes" buy food products that their children requested (0.47, $p=0.0012$; 0.76, $p=0.014$).

With regards to nutrition information sought, parents who sought both FOP nutrition information and other nutrition information rated FOP nutrition information significantly higher on believability than those who did not seek any nutrition information (1.61, $p<0.0001$; 0.91, $p=0.023$). However, parents who sought other nutrition information (including the nutrition facts table) rated FOP nutrition information significantly lower on believability than those who sought FOP nutrition information (-0.70, $p<0.0001$).

There was an interaction effect between FOP nutrition information type and BMI class. Specifically, parents in the underweight category rated *Given the Thumbs Up by Kids* significantly higher on believability than those in the normal and overweight categories.

6.3.3 Ease of Understanding

Table 11.1 shows the adjusted means for the rating of ease of understanding by FOP nutrition information type. Table 11.2 shows the outcomes of linear mixed model for ease of understanding.

Table 11.1: Adjusted Means for Ease of Understanding (N=897)

FOP Nutrition Information Type	Adjusted Mean	Standard Error
Source of Fibre	6.71	0.43
Health Check	6.87	0.43
Sensible Solution	5.57	0.43
Given the Thumbs Up by Kids	6.13	0.43

Table 11.2: Linear Mixed Model Outcomes for Ease of Understanding (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
FOP Nutrition Information Type	**3**	**111.41**	**<0.0001**
Order	3	1.34	0.26
Gender	**1**	**4.46**	**0.035**
Age Group	2	2.25	0.11
Number of Children (ages 4-10)	1	0.58	0.45
BMI Class	3	1.27	0.28
Education	2	2.37	0.094
Income	2	0.56	0.57
Ethnicity	1	0.02	0.88
Screen Time	5	0.57	0.72
Shopping Frequency	3	2.40	0.066
Bring Children to the Store	4	0.40	0.81
Children ask for Food Products	4	2.07	0.082
Buy Food Products for Children	**3**	**6.62**	**0.0002**
Children's Influence on Purchase Decision	4	1.29	0.27
Label Use	4	0.41	0.80
Nutrition Information Sought	**2**	**16.86**	**<0.0001**
Perceived Nutritional Knowledge	**4**	**3.17**	**0.013**
General Health	**4**	**2.45**	**0.044**
Medical Conditions	1	0.18	0.68

Table 20 in Appendix D shows contrasts for all variables in the linear mixed model for ease of understanding. There was a significant difference observed for the rating of ease of understanding across types of FOP nutrition information. On average, *Health Check* was rated the highest, followed by *Source of Fibre*, *Given the Thumbs Up by Kids* and *Sensible Solution* respectively.

With regards to socio-demographic factors, male parents rated FOP nutrition information significantly lower on ease of understanding than female parents (-0.30, p=0.035).

Parents who reported that they "sometimes", "usually" or "always" buy food products that their children requested rated FOP nutrition information significantly higher on ease of understanding compared to those who reported that they "almost never" buy food products that their children requested (0.81, p=0.0017; 1.22, p<0.0001; 1.43, p=0.0006). In addition, those who reported that they "usually" buy food products that their children requested rated FOP nutrition information significantly higher on ease of understanding than those who reported that they "sometimes" buy food products that their children requested (0.41, p=0.0088).

As for nutrition information sought, parents who sought FOP nutrition information rated FOP nutrition information significantly higher on ease of understanding than those who did not seek any nutrition information (1.26, p=0.0041). In contrast, parents who sought other nutrition information (including nutrition facts table) rated FOP nutrition information significantly lower on ease of understanding than those who sought FOP nutrition information (-0.68, p<0.0001).

Parents who "strongly agreed" that they are knowledgeable about health and nutrition issues rated FOP nutrition information significantly higher on ease of understanding than those who "strongly disagreed" (0.98, p=0.028). Likewise, parents who "agreed somewhat" or "strongly agreed" that they are knowledgeable about health and nutrition issues rated FOP nutrition information significantly higher on ease of understanding than those who were "neutral or had no opinion" (0.50, p=0.005; 0.64, p=0.0039).

Parents who reported good, very good or excellent health rated FOP nutrition information significantly higher on ease of understanding than those who reported poor health (1.24, p=0.012; 1.20, p=0.017; 1.55, p=0.0051).

There were interaction effects between FOP nutrition information type and age group as well as FOP nutrition information type and education. For the interaction between FOP nutrition information type and age group, parents rated *Sensible Solution* significantly lower on ease of

understanding if they were in the 45 and over age group compared to those in the 18-34 and 35-44 age groups.

For the interaction between FOP nutrition information type and education, parents rated *Health Check* significantly lower on ease of understanding if they were in the high education level category compared to those in the medium education level category. Similarly, parents rated *Sensible Solution* significantly lower on ease of understanding if they were in the high education level category compared to those in the low and the medium education level categories.

6.3.4 Perceived Effectiveness

Table 12.1 shows the adjusted means for the rating of perceived effectiveness by FOP nutrition information type. Table 12.2 shows the outcomes of linear mixed model for perceived effectiveness.

Table 12.1: Adjusted Means for Perceived Effectiveness (N=897)

FOP Nutrition Information Type	Adjusted Mean	Standard Error
Source of Fibre	5.35	0.47
Health Check	6.20	0.47
Sensible Solution	4.96	0.47
Given the Thumbs Up by Kids	4.93	0.47

Table 12.2: Linear Mixed Model Outcomes for Perceived Effectiveness (N=897)

Effect	Numerator Degree of Freedom	*F* Value	*p* value
FOP Nutrition Information Type	**3**	**107.04**	**<0.0001**
Order	3	0.56	0.64
Gender	**1**	**4.66**	**0.031**
Age Group	2	2.83	0.059
Number of Children (ages 4-10)	1	0.89	0.34
BMI Class	3	0.64	0.59
Education	2	1.00	0.37
Income	2	0.98	0.38
Ethnicity	1	1.79	0.18

Screen Time	5	1.25	0.28
Shopping Frequency	3	0.78	0.51
Bring Children to the Store	4	1.31	0.26
Children ask for Food Products	4	1.36	0.25
Buy Food Products for Children	**3**	**7.14**	**<0.0001**
Children's Influence on Purchase Decision	**4**	**2.58**	**0.036**
Label Use	4	1.98	0.095
Nutrition Information Sought	**2**	**27.61**	**<0.0001**
Perceived Nutritional Knowledge	4	1.61	0.17
General Health	4	1.28	0.27
Medical Conditions	1	0.00	0.94

Table 21 in Appendix D shows contrasts for all variables in the linear mixed model for perceived effectiveness. There was a significant difference observed for the rating of perceived effectiveness across types of FOP nutrition information. Overall, *Health Check* was rated the highest on perceived effectiveness, followed by *Source of Fibre*, *Sensible Solution* and *Given the Thumbs Up by Kids* respectively. However, there was no significant difference observed for the rating of perceived effectiveness between *Given the Thumbs Up by Kids* and *Sensible Solution*.

Also, no significant difference was observed for the rating of perceived effectiveness across the order of FOP nutrition information seen. As for socio-demographic factors, male parents rated FOP nutrition information significantly lower on perceived effectiveness than female parents (-0.34, p=0.031).

Parents who reported that they "sometimes", "usually" or "always" buy food products that their children requested rated FOP nutrition information significantly higher on perceived effectiveness compared to those who reported that they "almost never" buy food products that their children requested (0.89, p=0.0016; 1.31, p<0.0001; 1.81, p<0.0001). In addition, parents who reported that they "usually" or "always" buy food products that their children requested rated FOP nutrition information significantly higher on perceived effectiveness than those who reported that they "sometimes" buy food products that their children requested (0.42, p=0.014; 0.92, p=0.013).

Furthermore, parents who reported that their children “almost never” influence their purchase decision rated FOP nutrition information significantly lower on perceived effectiveness than those who reported that their children “never” influence their purchase decision (-1.09, p=0.023). In contrast, parents who reported that their children “usually” or “always” influence their purchase decision rated FOP nutrition information significantly higher on perceived effectiveness than those who reported that their children “almost never” influence their purchase decision (0.54, p=0.024; 0.82, p=0.024).

Parents who reported that they sought FOP nutrition information rated FOP nutrition information significantly higher on perceived effectiveness than those who reported that they did not seek any nutrition information (1.65, p=0.0006). On the other hand, parents who reported that they sought other nutrition information (including nutrition facts table) rated FOP nutrition information significantly lower on perceived effectiveness than those who reported that they sought FOP nutrition information (-0.96, p<0.0001).

There were interaction effects between FOP nutrition information type and age group as well as FOP nutrition information type and BMI class. For the interaction between FOP nutrition information type and age group, parents rated *Sensible Solution* significantly lower on perceived effectiveness if they were in the 45 and over age group compared to those in the 18-34 and 35-44 age groups.

For the interaction between FOP nutrition information type and BMI class, parents rated *Source of Fibre* significantly lower on perceived effectiveness if they were in the obese category compared to those in the normal and overweight categories.

6.3.5 Ranking of FOP Nutrition Information on Effectiveness

After rating each FOP nutrition information individually, parents viewed all four FOP nutrition information on the screen at the same time and were asked to rank each based on the question, “Overall, which type of nutrition information do you think would be most effective in helping people choose healthier foods?“ Parents were prompted to choose the FOP nutrition information that they thought was the most effective first and the least effective last.

Therefore, the most effective, which was chosen first, was given a score of 1 whereas the least effective, which was chosen last, was given the score of 4.

Table 13.1 shows the means for ranking of effectiveness by FOP nutrition information type adjusted for socio-demographic factors and measures related to screen time, shopping habits, label use, nutritional knowledge and health status. Table 13.2 shows contrasts for the ranking of ranking of effectiveness from the adjusted linear mixed model. None of the covariates and other predictors was significant and therefore, they were not included in the table. In addition, 40 parents were missing ranking data and therefore, they were not included in the Linear Mixed Model of Ranking of Effectiveness.

Table 13.1: Adjusted Means for Ranking of Effectiveness (n=857)

FOP Nutrition Information Type	Adjusted Mean	Standard Error
Source of Fibre	3.00	0.14
Health Check	1.67	0.14
Sensible Solution	2.74	0.14
Given the Thumbs Up by Kids	2.62	0.14

Table 13.2: Linear Mixed Model Outcomes for Ranking of Effectiveness (n=857)

FOP Nutrition Information Type	Estimate	95% CI	*p* value
Source of Fibre (ref) vs. Health Check	**-1.33**	**-1.43 – -1.24**	**<0.0001**
Source of Fibre (ref) vs. Sensible Solution	**-0.26**	**-0.35 – -0.16**	**<0.0001**
Source of Fibre (ref) vs. Thumbs Up	**-0.37**	**-0.47 – -0.28**	**<0.0001**
Health Check (ref) vs. Sensible Solution	**1.07**	**0.98 – 1.17**	**<0.0001**
Health Check (ref) vs. Thumbs Up	**0.96**	**0.86 – 1.06**	**<0.0001**
Sensible Solution (ref) vs. Thumbs Up	**-0.12**	**-0.21 – -0.019**	**0.019**

From table 13.2, there was a significant difference observed for the ranking of FOP nutrition information across the types of FOP nutrition information. Overall, *Health check* was given the lowest ranking score, followed by *Given the Thumbs Up by Kids*, *Sensible Solution* and *Source of Fibre*. Thus, *Health check* was ranked the highest on effectiveness, followed by *Given the Thumbs Up by Kids*, *Sensible Solution* and *Source of Fibre* respectively.

There were interaction effects between FOP nutrition information type and age group, BMI class, education and income. For the interaction between FOP nutrition information type and age group, parents ranked *Sensible Solution* significantly higher on effectiveness if they were in the 35-44 and 45 and over age groups compared to those in the 18-34 age group.

For the interaction between FOP nutrition information type and BMI class, parents ranked *Source of Fibre* significantly higher on effectiveness if they were in the obese category compared to those in the normal category. Parents ranked *Sensible Solution* significantly lower on effectiveness if they were in the obese category compared to those in the normal and overweight categories. Parents also ranked *Given the Thumbs Up by Kids* significantly lower on effectiveness if they were in the underweight category compared to those in the normal, overweight and obese categories.

For the interaction between FOP nutrition information type and education, parents ranked *Source of Fibre* lower on effectiveness if they were in the high education level category compared to those in the low and the medium education level categories. In contrast, parents ranked *Sensible Solution* significantly higher on effectiveness if they were in the high education level category compared to those in the low and the medium education level categories.

For the interaction between FOP nutrition information type and income, parents ranked *Health Check* significantly lower on effectiveness if they were in the high income level category compared to those in the low income level category. On the other hand, parents in the low income level category ranked *Given the Thumbs Up by Kids* significantly lower on effectiveness than those in the medium and the high income level categories.

7.0 DISCUSSION

This study was one of the first quantitative studies in Canada to examine parental perceptions of children's food products, particularly with regards to cartoon characters and FOP nutrition information on the package. Overall, the results of the current study indicated that cartoon characters and FOP nutrition information influence parental perceptions of children's food products favourably.

7.1 Children's Food Product Rating Outcomes

The presence of cartoon characters on packaging increased perceived product appeal to children, both for products with FOP nutrition information and those without. However, products with both cartoon characters and FOP nutrition information were rated as most appealing. It should be noted that the online survey question for appeal specifically asked parents if their children would like the product. Thus, it was not surprising that cartoon characters increased the appeal of the product. Nonetheless, the fact that products with both cartoon characters and FOP nutrition information were rated the highest when compared to products in the *Standard* condition indicated that parents found FOP nutrition information appealing. The current findings are consistent with previous research indicating that children prefer food products with cartoon characters on the package (Roberto et al., 2010; Hill & Tilley, 2002). Parents are likely to be aware of this preference and may select products that their children will like. Moreover, if the product conveys nutritional benefits (such as FOP nutrition information), they are even more likely to find the product appealing. A previous study found that mothers preferred products that they believe to be healthy and that they think their children will like (Gelperowic & Beharrell, 1994). Hence, food products showing both cartoon characters and FOP nutrition information and food products showing cartoon characters are more likely to be appealing to parents compared to products with only FOP nutrition information or products with standard packaging, consistent with our original hypothesis.

Product appeal also varied by product type. For instance, *Aunt Jemima pancakes* was rated the most appealing, followed by *Kellogg's Fibre Plus granola bars*, *Heinz spaghetti* and *PC bran*

bites. Again, these products were rated according to parents' opinion of whether or not their children would like the product. Children often prefer sweet-tasting foods (Ventura & Mennella, 2011) and products such as pancakes and granola bars are typically sweet or can be sweetened (with syrup for pancakes), as opposed to products like spaghetti. The finding that appeal varied by product type, reinforces the importance of testing marketing and nutritional information across a variety of products.

Products with FOP nutrition information were rated the highest on nutritional quality. This is consistent with previous research finding which showed that nutrition claims influenced the perception of a food product's nutritional value favourably in the absence of the nutrition facts table (Roe et al., 1999).

Product type also greatly influenced the rating of nutritional quality. *PC bran bites* was rated the highest on nutritional quality, followed by *Kellogg's Fibre Plus granola bars*, *Aunt Jemima pancakes*, and *Heinz spaghetti* respectively. It was not surprising that *PC bran bites* was rated the highest, the word "bran" alone already hinted at the product's nutritional value. Even though the ingredient list was not presented to parents in the online survey, the word "bran" indicated that the product is made from wheat bran which is healthier than refined wheat. The same is also true for *Kellogg's Fibre Plus granola bars*, as fibre is often promoted for healthy eating. The name "Fibre Plus" alluded to a product with high fibre content even though parents did not see the nutrition facts table. *Aunt Jemima pancakes* and *Heinz spaghetti* are generic products and thus, might not be considered as nutritious as *PC bran bites* and *Kellogg's Fibre Plus granola bars* which are promoted as healthy.

Cartoon characters and FOP nutrition information did not influence intention to buy or willingness to pay in the study. Previous research has found that colours and typescripts influenced consumers' perception of the products' value (Silayoi & Speece, 2007; Ampuero & Villa, 2006). In addition, parents did not have the opportunity to pick up the product and examine it thoroughly in the study as they would have in the store. Other elements of the package not shown in the study, such as the nutrition facts table, the ingredient list, etc., may

have a greater influence on intention to buy and willingness to pay than cartoon characters or FOP nutrition information.

Moreover, it is likely that children's food packages are designed using cartoon characters to influence children's intention to buy the product. Once children identify an appealing packaging for a food product, they are likely to pester their parents to buy the product. Parents will often buy the product for their children, not because they intended to buy the product, but to appease or avoid conflict with their children. Therefore, this might be another reason why the study did not find significant difference with intention to buy or willingness to pay.

Product type influenced the ratings of intention to buy and willingness to pay. Overall, both *Aunt Jemima pancakes* and *Kellogg's Fibre Plus granola bars* were rated higher on intention to buy and willingness to pay. These two products may already be in the food repertoire that parents usually buy for their family, and thus, they were more inclined to buy or willing to pay for these two products. In addition, *PC bran bites* is not a typical children's product and parents might be less inclined to buy it. Lastly, *Heinz spaghetti* is a low-priced product, and thus, might be perceived as of low quality (as indicated by its low rating on nutritional quality). Parents might be less inclined to buy such products for their children.

Overall, there was no clear pattern between socio-demographic factors and product rating outcomes. BMI only affected the rating of willingness to pay. Overall, obese, overweight and normal weight parents generally rated products less favourably on willingness to pay than underweight parents. It might be that normal weight, overweight and obese parents are more cautious about the food products they purchase for their children, and therefore, they were less influenced by cartoon characters and FOP nutrition information. This is in line with the view that overweight parents may adopt child-feeding practices to prevent overweight in their children (Golan & Crow, 2004). In addition, the food products might not be the typical products that normal weight, overweight and obese parents buy for their children; hence, they were less willing to pay for such products.

Other significant socio-demographic factors included gender, age group, number of children aged 4-10 years old, education and income. Male parents rated products higher on willingness

to pay than female parents, while parents in the older age groups (35-44, 45 and over) rated products lower on willingness to pay than parents in the younger age group (18-34). Parents with two or more children aged 4-10 years rated products higher on appeal than those with only one child aged 4-10 years. Furthermore, parents with high education rated products lower on intention to buy than those with medium education and parents with high income rated products higher on willingness to pay than those with medium income.

It was not surprising that males rated products higher on willingness to pay, since previous research has shown that females are more likely to read food labels than males (Drichoutis et al., 2006; Cowburn & Stockley, 2005; Kim et al., 2001). Therefore, females may have been less likely to pay for products that they did not think were healthy, particularly, when they did not have enough information to confirm the product's nutritional value (such as the nutrition facts table). Older age groups might also be more cautious about the food they buy, and thus, gave lower rating for products that they did not think were nutritious. Previous research found that older individuals tend to read food labels more than younger individuals (Drichoutis et al., 2006; Kim et al., 2001). Since the nutrition facts table and ingredient list were not shown in the study, older parents might be less willing to pay for a product whose nutritional value could not clearly be evaluated.

Furthermore, parents with two or more children aged 4-10 years old might be less strict with their children and more likely to buy products that would appease them to avoid conflict. Previous research indicated that children use pester power to influence their parents into buying products that they like (Nicholls & Cullen, 2004). This might be the reason why parents with two or more children aged 4-10 years rated products higher on appeal than parents with only one child aged 4-10 years. Parents may have harder time dealing with two or more children pestering them to buy food products than just one child; thus, they are more likely to give in to their children's request. Parents with more education are also more likely to read food labels (Drichoutis et al., 2006; Cowburn & Stockley, 2005). Hence, parents with high education are more likely to scrutinize food products closely. This might explain why they gave lower rating on intention to buy than parents with medium education. On the other hand,

parents with high income are unlikely to be sensitive about price, and therefore, gave higher rating on willingness to pay compared to those with medium income.

For the rating of nutritional quality, there was a two-way interaction effect between condition and education level. In *Standard* and *FOP Nutrition Information* conditions, parents with high education rated products lower on nutritional quality than parents with medium and low education. Likewise, in the *Cartoon* condition, parents with high education rated products lower on nutritional quality than parents with medium education. As previously mentioned, parents with high education are more likely to read food labels (Drichoutis et al., 2006; Cowburn & Stockley, 2005). Therefore, they are more likely to scrutinize food products more closely, especially with regards to nutritional quality.

For the rating of intention to buy, there was an interaction effect between condition and gender. In the *Standard* condition, male parents rated products higher on intention to buy than female parents. As previously mentioned, females are more likely to read food labels than males (Drichoutis et al., 2006; Cowburn & Stockley, 2005; Kim et al., 2001). Thus, they were probably less likely to buy products that they did not have enough information to evaluate. .

A pattern emerged between screen time and product rating outcomes. Parents rated products higher on nutritional quality, intention to buy and willingness to pay if they reported that their children spent one hour or more per day in front of a screen compared to those who reported that their children spent less than one hour per day in front of a screen. Parents whose children spent one hour or more per day in front of a screen might be more lenient towards their children. They might be more likely to buy food products that their children requested in order to appease them and avoid conflicts. Children who spend one hour or more per day in front of the screen are also more likely to be exposed to food advertisements (TV and Internet) compared to those who spent less than one hour per day in front of a screen. Research has shown that children exposed to food advertisements are more likely to choose the advertised products (Center of Science in the Public Interest, 2003) and they are more likely to request or pester their parents to buy the advertised food products (Institute of Medicine, 2006; Story & French, 2004; Hastings et al., 2003; Coon & Tucker, 2002). Thus, children may pester their

parents to buy the advertised food products; parents may give in to avoid conflicts, which may lead them to be less critical about the food products they buy for their children.

Parent's shopping habits also influenced product rating outcomes. Shopping frequency affected the ratings of appeal and nutritional quality. Parents who reported shopping more frequently rated products lower on appeal and nutritional quality than those who reported shopping less frequently. Parents who shopped more frequently may be more knowledgeable about food products and pay more attention to food labels than parents who shopped less frequently. Previous research has shown that individual characteristics such as product knowledge, awareness, and familiarity affect nutrition label usage (Burton & Andrews, 1996).

In addition, parents who reported that they bring their children to the store rated products higher on appeal that those who reported that they never bring their children to the store. Parents who reported that their children frequently ask for food products rated products higher on appeal, nutritional quality and intention to buy than those who reported that their children seldom ask for food products. Moreover, parents who reported that they frequently buy food products that their children requested rated products higher on nutritional quality, intention to buy and willingness to pay than those who reported that they seldom buy food products that their children requested. Parents also rated products higher on nutritional quality if they reported that their children influenced their purchase decision to a greater extent. These parents may overlook the nutritional value of food products if they believe their children will like them. However, it should be noted that parents did not see the nutrition facts table in the online survey, they may rate the products differently if they were shown the nutrition facts table. These results were in line with previous research, which showed that children use pester power to request food products from parents (Nicholls & Cullen, 2004) and parents gave in 50% of the time in order to avoid conflicts (McNeal, 1999). In addition, permissive parenting style, in which parents are indulgent toward their children (Stang & Loth, 2011), is associated with a two-fold increased risk of obesity (Rhee, 2008). Therefore, parents who give in to their children's request for unhealthy food products are likely increasing their children's risk of obesity.

Label use and nutritional knowledge also influenced product ratings. Parents who reported reading food labels more frequently rated products higher on appeal. In addition, parents who sought FOP nutrition information on food products rated products higher on appeal and nutritional quality than those who reported not seeking any nutrition information. In contrast, parents who sought other nutrition information (including the nutrition facts table) rated products lower on appeal, nutritional quality and intention to buy than those who reported seeking FOP nutrition information. These results are consistent with previous research showing that nutrition claims influenced the perception of a product's nutritional value favourably in the absence of the nutrition facts table (Roe et al., 1999). However, when the nutrition facts table was shown, the effect of nutrition claims was mitigated or rendered non-significant (Mitra et al., 1999; Ford et al., 1996). These results confirmed that parents rely more on the nutrition facts table when evaluating the nutritional value of the food product more so than the FOP nutrition information.

In addition, parents who strongly "agreed" or "disagreed" that they are knowledgeable about health and nutrition issues rated products lower on intention to buy compared to those who were "neutral" or "had no opinion" or "agreed somewhat" that they are knowledgeable about health and nutrition issues. It was surprising to see that parents who strongly "agreed" and parents who strongly "disagreed" rated products the same way. It might be that parents who "strongly agreed" recognized that the products were not healthful and rated them lower on intention to buy whereas parents who "strongly disagreed" were reserved about giving high score due to their lack of knowledge about the products.

Furthermore, parents who reported their health as very good rated products higher on appeal than those who reported their health as fair or good while parents who reported having a medical condition also rated products higher on appeal than those without any medical condition.

7.2 FOP Nutrition Information Rating Outcomes

Overall, results indicated that the majority of parents had seen *Sensible Solution*, *Health Check* and *Source of Fibre* prior to the study. Only a quarter of parents had seen *Given the Thumbs Up by Kids*. This was not surprising since *Given the Thumbs Up by Kids* appears exclusively on President's Choice Mini Chef Line of food products for kids. There are not many products in the line and some have been discontinued.

The *Health Check* symbol was rated the highest on believability, ease of understanding and perceived effectiveness, *Source of Fibre* came in second followed by *Sensible Solution* and *Given the Thumbs Up by Kids*. *Given the Thumbs Up*, however, was rated higher on ease of understanding than *Sensible Solution*. Previous research has suggested that consumers are reluctant to trust nutrition information provided by manufacturers (Bhaskaran & Hardley, 2002). Thus, it was not surprising that *Health Check* was rated the highest on all three outcome measures, given that it was developed and promoted by the Heart and Stroke foundation, a well-known non-profit health organization. *Health Check* was developed to help consumers choose healthier products and products displaying the *Health Check* symbol were evaluated by Heart and Stroke dietitians. *Source of Fibre* is a nutrient content claim that is regulated by the Canadian Food Inspection Agency. It should be noted that in addition to *Source of Fibre*, the other three FOP nutrition information also contained the nutrient content claim, "Source of Fibre", in small font inside or underneath their symbols. Although it is not clear whether or not parents are aware that the nutrient content claim is regulated by the government, the fact that *Source of Fibre* can be checked by looking at the nutrition facts table (which was not shown in the online survey) might be the reason why it was rated the second highest on three outcome measures. On the other hand, *Sensible Solution* and *Given the Thumbs Up by Kids* were developed by food manufacturers, Kraft and Loblaws, respectively. As previously mentioned, consumers may be reluctant to trust information from manufacturers (Bhaskaran & Hardley, 2002) which would explain why these two FOP nutrition information were rated the lowest on all three outcomes.

The rating and ranking tasks for "overall effectiveness" produced different results. For the rating of perceived effectiveness, *Health Check* was rated the highest, followed by *Source of Fibre*, *Sensible Solution*, and *Given the Thumbs Up by Kids* respectively. For the ranking of effectiveness, *Health Check* was ranked the most effective, followed by *Sensible Solution*, *Given the Thumbs Up by Kids* and surprisingly, *Source of Fibre* was ranked the least effective. In the ranking task, parents saw all four types of FOP nutrition information together. They might have noticed that all of them contained the nutrient content claim, "Source of Fibre" and therefore ranked *Source of Fibre* as the least effective since the other three FOP nutrition information also contained other information and graphics.

Although, different types of FOP nutrition information were rated significantly different on believability, ease of understanding and perceived effectiveness. The type of FOP nutrition information did not have any significant effect on product rating outcomes. It might be that parents did not care about the type of nutrition information when examining the product package. The mere present of a FOP nutrition information on the package, no matter where it came from, was enough to influence perceived nutritional quality of food products. In addition, the appearance of the product package as a whole might be more important to parents when they were rating the products.

Among socio-demographic factors, only gender was associated with FOP nutrition information rating outcomes. Males rated FOP nutrition information lower on ease of understanding and perceived effectiveness than females. Previous studies have shown that females read food labels more than males (Drichoutis et al., 2006; Cowburn & Stockley, 2005; Kim et al., 2001), and thus, they are probably more knowledgeable about nutrition issues. As a result, females might find these types of FOP nutrition information easier to understand than males which also increased their rating for perceived effectiveness.

There were some interaction effects between socio-demographic factors and FOP nutrition information type. There was an interaction effect between FOP nutrition information type and BMI class for the ratings of believability and perceived effectiveness, and the ranking of effectiveness. Underweight parents rated *Given the Thumbs Up by Kids* higher on believability

than normal and overweight parents. Obese parents rated *Source of Fibre* lower on perceived effectiveness than normal and overweight parents. On the contrary, for the ranking of effectiveness, obese parents ranked *Source of Fibre* higher on effectiveness than normal parents. Obese parents also ranked *Sensible Solution* lower on effectiveness than normal and overweight parents. Underweight parents ranked *Given the Thumbs Up by Kids* lower on effectiveness than normal, overweight and obese parents. There was no clear pattern observed with the interaction effect between FOP nutrition information type and BMI class.

There was an interaction effect between FOP nutrition information type and age group for the ratings of ease of understanding and perceived effectiveness and the ranking of effectiveness. Parents rated *Sensible Solution* lower on ease of understanding and perceived effectiveness if they were in the oldest age group (45 and over) compared to those in the two younger age groups (18-34 and 35-44). In contrast, parents ranked *Sensible Solution* higher on effectiveness if they were in the two older age groups (35-44 and 45 and over) than parents in the youngest age group (18-34). A previous study reported that older people found labels to be less understandable (Burton & Andrews, 1996). Thus, parents in the older age groups might have found *Sensible Solution* to be less understandable and rated them lower on ease of understanding and perceived effectiveness. For the ranking task, parents were presented with all four FOP nutrition information all at once. Seeing all four FOP nutrition information at the same time might have influenced parents' ranking of effectiveness differently than seeing FOP nutrition information one at a time as in the rating task. Thus, older parents might have found *Sensible Solution* to be more effective when seeing it against the other three FOP nutrition information than just seeing it by itself.

Furthermore, there was an interaction effect between FOP nutrition information type and education for the rating of ease of understanding and the ranking of effectiveness. Parents with high education rated *Health Check* lower on ease of understanding than those with medium education. Similarly, parents with high education rated *Sensible Solution* lower on ease of understanding than those with medium or low education. Parents with high education also ranked *Source of Fibre* lower on effectiveness than parents with medium and low education. On

the contrary, parents with high education ranked *Sensible Solution* higher on effectiveness than parent with medium and low education. Overall, higher educated parents rated FOP nutrition information lower on ease of understanding and ranked them lower on effectiveness. Although higher educated individuals are more likely to read food labels (Drichoutis et al., 2006), they are also less likely to think that reading labels makes it easier to choose food products (Nayga, 1999). Higher educated individuals might find FOP nutrition information more too simplistic than other nutrition information such as the nutrition facts table and rated them lower on ease of understanding and ranked them lower on effectiveness. For *Sensible Solution* being ranked high on effectiveness, as mentioned above, the ranking of effectiveness might have been influenced by seeing four FOP nutrition information all at once rather than one FOP nutrition information by itself as in the rating task.

Lastly, there was an interaction effect between FOP nutrition information type and income for the ranking of effectiveness. Parents with high income ranked *Health Check* lower on effectiveness than those with low income. On the other hand, parents with low income ranked *Given the Thumbs Up by Kids* lower on effectiveness than those with high and medium income. With regards to income, there were inconsistent findings in the literature, but individuals with high income are more likely to use nutrition labels (Nayga, 1999). Parents with high income might have found FOP nutrition information such as *Health Check* too simplistic and ranked them lower on effectiveness. As for *Given the Thumbs Up for Kids*, parents with low income might have found it to be less effective because they were more likely to be less educated and might not clearly understand the information presented.

Overall, parents who were more influenced by their children's request for food products were more likely to rate FOP nutrition information as more believable, easy to understand and effective. As previously mentioned, parents who are influenced by their children may be more likely to overlook a product's nutritional value if they believe their children will like the product.

Parents who sought FOP nutrition information on food products rated FOP nutrition information higher on believability, ease of understanding and perceived effectiveness than those who reported not seeking any nutrition information. In contrast, parents who sought

other nutrition information (including the nutrition facts table) rated FOP nutrition information lower on believability, ease of understanding and perceived effectiveness than those who reported seeking FOP nutrition information. As previously mentioned, these results confirmed previous findings which showed that nutrition claims positively influenced the perception of a product's nutritional value when the nutrition facts table was not present (Roe et al., 1999). In contrast, when the nutrition facts table were seen, nutrition claims did not have a significant effect on the perception of the product's nutritional value (Mitra et al., 1999; Ford et al., 1996).

Moreover, parents who reported greater knowledge about health and nutrition issues rated FOP nutrition information higher on ease of understanding that those who "strongly disagreed" or were "neutral or had no opinion". This was not surprising since parents who are more knowledgeable about health and nutrition issues are more likely to understand the FOP nutrition information better than those who are less knowledgeable.

Lastly, parents who reported better health rated FOP nutrition information higher on ease of understanding than those who reported poor health.

7.3 Strengths & Limitations

The study had several strengths. First, it utilized a mixed (within/between subjects) experimental design to examine the impact of packaging, especially with regards to cartoon characters and FOP nutrition information, on parental perceptions of children's food products. The mixed design, in which participants see all four conditions in the study, reduced errors associated with individual differences. Participants were also randomly assigned to each condition, thus reducing the carrying over effect associated with within-subjects design. In addition, the study's large sample size (n=897) provided sufficient power to detect relatively modest differences between conditions.

The study also tested the effect of cartoon characters and FOP nutrition information across four types of food products. This controlled for differences in ratings that were due to the effect of product type. The study results indicated that product type was a significant predictor of product rating outcomes, and needed to be controlled in research dealing with marketing of

food products. The study also tested FOP nutrition information from different sources, the food industry, non-profit organization and the government. Thus, the study was able to discern the effect of FOP nutrition information from different sources.

There were some limitations of the current study. First, the sample was recruited through GMI, a market research company. Participants registered with GMI required internet access; therefore, individuals who lack internet access such as those in low socioeconomic status (SES) may be underrepresented in the study. The study could have recruited participants in person to increase representation of low SES individuals. However, the sampling design for in-person surveys also includes biases and is far more difficult to recruit a geographically diverse sample. The study sample recruited through GMI came from across Canada, and although not entirely representative, it allowed for better generalization across the Canadian population than sample recruited locally.

The selection bias resulted from recruiting through GMI is noted in the sample characteristics. High proportions of the sample have medium or higher education. Previous research has shown that individuals with high education are more likely to read food labels (Drichoutis et al., 2006). Therefore, parents with high education were more likely to rate products lower on nutritional quality especially in the absence of the nutrition facts table. Moreover, the survey was self-reported; thus, social desirability bias might have occurred. For instance, parents might be less willing to be truthful when answering questions regarding their children's influence on their purchase behaviour. Parents who often give in to their children's request for food products might not want to report their behaviour because they did not want to be seen as bad parents. Thus, parents might be underreporting their shopping behaviour with children.

Furthermore, the survey could not simulate the shopping experience in the store where parents would be able to pick up the food product and examine it thoroughly. In addition, the study did not include the nutrition facts table, the ingredient list or other elements of packaging in the survey. Therefore, the rating of the food products might have been different if parents were able to view other nutrition information. Research has shown that individuals tend to rely more on the nutrition facts table than nutrition claims when evaluating food products (Mitra et al.,

1999; Ford et al., 1996). Therefore, parents are likely to rate food products lower on product rating outcomes if they see the nutrition facts table than seeing only the FOP nutrition information on products of low nutritional value. Lastly, only four types of FOP nutrition information and food products were used in the study. Therefore, results might not be generalizable to other types of FOP nutrition information and food products.

7.4 Conclusions

This study was one of the first in Canada to examine the impact of food packaging, particularly, cartoon characters and FOP nutrition information on parental perceptions of children's food products. The results confirmed that cartoon characters and FOP nutrition information influence parental perceptions of children's food products of low nutritional value favourably. In addition, the study also found that FOP nutrition information mandated by government and provided by non-profit organizations is generally rated more favourably than FOP nutrition information provided by food manufacturers.

The food industry has been implicated in the rising epidemic of childhood obesity by promoting food products that are high in fat and sugars to children (Harris et al., 2009; Institute of Medicine, 2006). Cartoon characters are often used to attract children to food products whereas FOP nutrition information is aimed toward parents. The use of FOP nutrition information to promote unhealthy food products as healthy is an increasing concern given that packaging may highlight one aspect of the product that is desirable but may not represent the overall nutritional value of the product.

The current study found that adding cartoon characters and FOP nutrition information on products with low nutritional values increased their perceived appeal and nutritional quality. Therefore, it might be reasonable to re-evaluate regulations of children's food marketing, specifically with regards to the use of cartoons and FOP nutrition information on children's food product of low nutritional values.

The current findings also highlight the need to regulate FOP nutrition information. The study did not find significant differences for the type of FOP nutrition information type on product

rating, which suggests that arbitrary industry initiatives may be equally influential as “official” FOP nutrition information. Given that industry FOP nutrition information is commonly display on foods of low nutritional value, the lack of regulation has the potential to mislead consumers. The Institute of Medicine (IOM) in the US has taken step to standardized FOP labelling system. In a recent report on FOP nutrition rating systems from the IOM in the US, the IOM recommended a simple, standard FOP symbol that will appear across food products (Institute of Medicine, 2011). This FOP symbol would display calories in common household measure serving sizes and zero to three “nutritional” points (for saturated and trans-fat, sodium and added sugars) (Institute of Medicine, 2011). The aim of the proposed FOP symbol is to not only inform consumers about the nutrition content but also to encourage healthier choices and purchase behaviours (Institute of Medicine, 2011).

The standardization of FOP nutrition information which is regulated by the government is one step to which to help prevent misuse of FOP nutrition information to promote unhealthy products as healthy. Standardizing nutrition information of the front of packages also has the potential to help parents select food products that are actually healthy for their children.

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APPENDICES

Appendix A: Tentative Proposed Standards for Marketing Foods to Children 2-17

Standard I: Foods Exempt from Standards II and III	**The following foods are part of a healthful diet and may be marketed to children without meeting standards II and III.** ✓ 100% fruit and fruit juices in all forms ✓ 100% vegetables and vegetable juices in all forms; must not exceed 140 mg of sodium per RACC* ✓ 100% non-fat and low-fat milk and yogurt ✓ 100% whole grains ✓ 100% water **Note:** 100% is defined as no added nutritive or non-nutritive sweeteners and no other functional ingredients added to the product, except flavouring for water, milk, and yogurt
Standard II: Meaningful Contribution to a Healthful Diet	**Food marketed to children must provide a meaningful contribution to a healthful diet.** **Option A:** ✓ Food must contain at least 50% by weight of one or more of the following: fruit, vegetable; whole grain; fat-free or low-fat milk or yogurt; fish; extra lean meat or poultry; eggs; nuts and seeds; or beans **Option B:** ✓ Food must contain one or more of the following per RACC:* - 0.5 cups of fruit or fruit juice - 0.6 cups vegetables or vegetable juice - 0.75 oz. equivalent of 100% whole grain - 0.75 cups milk or yogurt; 1 oz. natural cheese; 1.5 oz. processed cheese - 1.4 oz. meat equivalent of fish or extra lean meat or poultry - 0.3 cups cooked dry beans - 0.7 oz. nuts or seeds - 1 egg or egg equivalent
Standard III: Nutrients to Limit	**Foods marketed to children must not contain more than the following amounts of saturated fat, trans fat, sugar, and sodium.** **Saturated Fat:** ✓ 1 g or less per RACC* and not more than 15% of calories **Trans Fat:** ✓ 0 g per RACC* (<0.5g)

	Sugar: ✓ No more than 13 g of added sugars per RACC* **Sodium:** ✓ No more than 200 mg per portion[§]

*For foods with a small RACC (30 g or less or 2 tablespoons or less), the criteria refer to the amount per 50 g of food.

[§]This level is interim and over time should be reduced to 140 mg per RACC.*

The original document is available at:
http://ftc.gov/bcp/workshops/sizingup/SNAC_PAC.pdf

Appendix B

Table 14: Experimental Conditions (All Possible Food Images)

Condition 1 Standard					
Condition 2 Cartoon Character					
Condition 3 FOP Nutrition Information	Sensible Solution				
	Given the Thumbs Up by Kids				
	Health Check				
	Source of Fibre				
Condition 4 Cartoon Character & FOP Nutrition Information	Sensible Solution				
	Given the Thumbs Up by Kids				

Health Check				
Source of Fibre				

Appendix C: Survey Questionnaire

SCREENER & INFO / CONSENT

Introduction:

Welcome, and thank you for your interest in our children's food study! To begin, you will be asked a couple of questions to determine your eligibility to participate in the study. After these question there is an information page followed by the survey. Please press "continue" to begin.

Screening Script:

Before we begin, how old are you? _____ [1-99 limit]

If 18 years or over → [Proceed to Children question]
If under age 18 → "Unfortunately, we can only include people age 18 and older in this study. Sorry, you are not eligible to participate, but thank you for your time." [TERMINATE]
→**IF REFUSED:** Unfortunately, we need to know your age to determine your eligibility for the study.

Do you have any children between the ages 4-10?

1. Yes
2. No
3. Refused
4. Don't Know

If Yes → [Proceed to Primary Shopper question]
If No -> "Unfortunately, we can only include people who have one or more children between ages 4-10 in this study. Sorry, you are not eligible to participate, but thank you for your time." [TERMINATE]
→**IF REFUSED / DON'T KNOW:** Unfortunately, we need to know whether you have any children between ages 4-10 to determine your eligibility for the study.

Are you the primary shopper of your household?

1. Yes
2. No
3. Refused
4. Don't Know

If Yes → [Proceed to Introduction]
If No -> "Unfortunately, we can only include people who are the primary shopper of their household. Sorry, you are not eligible to participate, but thank you for your time." [TERMINATE]
→**IF REFUSED / DON'T KNOW:** Unfortunately, we need to know whether you are the primary shopper of your household to determine your eligibility for the study.

INTRODUCTION

Thank you for your interest. You are now going to be provided with some information about the study. Please read the following information carefully, and once you have read the study details and agree to them, you can begin the survey.

- You are being asked to participate in a research study that asks for people's opinions about children's foods. As well, you will be asked about characteristics of your children, shopping habits and demographics concerning you. The Children's Food Survey is being conducted by Dr. David Hammond of the University of Waterloo.
- The survey takes approximately 20 minutes to complete.
- You must be 18 years of age or older to participate in this study.
- Participation is voluntary and you may decline to answer particular questions if you wish.
- In appreciation of your time, you will receive remuneration from GMI in accordance with their usual rate as a token of our thanks.
- Your identity and all of the information you provide in this study will be kept strictly confidential - only the investigators and research assistants directly associated with the study will have access to this information.
- You are free to choose whether or not to continue participation in this study, and you can choose to stop being a part of it at any time. You can withdraw from the survey by closing the survey window. You will still receive full remuneration for your time.
- This study has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your involvement in this study, please contact Susan Sykes in the Office of Research Ethics at 519-888-4567 ext. 36005 or ssykes@uwaterloo.ca.
- If you have any questions about the study you can contact Dr. David Hammond of the University of Waterloo at 519-888-4567 ext. 36462 or dhammond@uwaterloo.ca.

CONSENT FORM

Based on the information you received, do you agree to take part in this research study being conducted by Dr. David Hammond of the University of Waterloo?

Yes → **IF YES, continue to survey**

No → **IF NO,** Thank you for your time. **TERMINATE**

CHILDREN'S CHARACTERISTICS	
Thank you! Please be assured that all your responses will be kept entirely confidential.	
Number of Children Ages 4-10	How many children do you have between the ages 4-10? _____ [1-99 limit]
Child's Gender	[Programmer note: If one child:] What is the gender of your child between the ages of 4 - 10? 1. Girl 2. Boy 3. Refused 4. Don't Know [Programmer note: If more than one child:] What are the genders of your children? 1. Girl 2. Boy 3. Girl and boy 4. Refused 5. Don't Know
Number of Children Ages 11-18	How many children do you have between the ages 11-18? 1. _____ [1-99 limit]
Preamble	[Programmer note: only display for parents with children between the ages of 11-18] For the rest of this survey, I would like you to think about your children between the ages of 4 to 10 when answering questions.
Screen Time	[Programmer note: if one child, use "child" in the question; if more than one child, use "children" in the question] In the LAST 7 DAYS, about how many hours a day, on average, did your child (children) spend: watching TV/movies, playing video/computer

	games, on a computer chatting, emailing, or surfing the internet? 1. None 2. Less than 1 hour per day 3. 1 to 2 hours per day 4. 3 to 4 hours per day 5. 5 to 6 hours per day 6. 7 or more hours per day 7. Refused 8. Don't Know
SHOPPING HABITS	
Frequency of Shopping	How often do you shop for food? 1. Less than 1 time per month 2. 1 time per month 3. 2-3 times per month 4. 1 time per week 5. More than 1 time per week 6. Refused 7. Don't Know
Shopping with Children	[Programmer note: if one child, use "child" in the question; if more than one child, use "children" in the question] How often, if at all, do you bring your child (children) to the store with you? 1. Never 2. Almost never 3. Sometimes 4. Usually 5. Always 6. Refused 7. Don't Know How often, if at all, does (do) your child (children) ask you to buy particular food products in the store? 1. Never 2. Almost never 3. Sometimes 4. Usually 5. Always 6. Refused

	7. Don't Know How often, if at all, do you buy the food product that your child (children) requests (request)? 1. Never 2. Almost never 3. Sometimes 4. Usually 5. Always 6. Refused 7. Don't Know
Children's Influence on Food Purchase Decision	How often, if at all, do you think your child (children) influences (influence) your food purchase decision? 1. Never 2. Almost never 3. Sometimes 4. Usually 5. Always 6. Refused 7. Don't Know

CHILDREN'S FOOD PRODUCTS RATING	
	You will now be shown a series of food products, one at a time. Please take a moment to look at each product before answering the questions. [Programmer note: images of each food product will be shown on the screen, with questions immediately below]
Appeal	[Programmer note: if one child, use "child" in the question; if more than one child, use "children" in the question] Do you think your child (children) would **like** this product? 1. Not at all 2. 3. 4. 5. 6. 7.

	8. 9. 10. Definitely 11. Refused / Don't Know
Nutritional Quality	Do you think this product would be **nutritious** for your child (children)? 1. Not at all 2. 3. 4. 5. 6. 7. 8. 9. 10. Definitely 11. Refused / Don't Know
Intention to Buy	Would you consider **buying** this product for your child? 1. Not at all 2. 3. 4. 5. 6. 7. 8. 9. 10. Definitely 11. Refused / Don't Know
Willingness to Pay	What is the highest amount you would be **willing to pay** for this product? 1. I would not purchase this product regardless of price 2. $1.50 or less 3. $1.51 - $2.50 4. $2.51 - $3.50 5. $3.51 - $4.50 6. $4.51 - $5.50 7. More than $5.50 8. Refused

	9. Don't Know
	[**Repeat sets for the remaining three food products**]
NUTRITION INFORMATION RATING	
	You will now be shown four types of nutrition information, one at a time. Please take a moment to look at each type of nutrition information before answering the questions. [images of nutrition information will be shown on the screen, with questions immediately below]
Exposure	Have you seen this type of nutrition information before this study? 1. No 2. Yes 3. Refused 4. Don't know
Believability	In your opinion, is this nutrition information **believable**? 1. Not at all 2. 3. 4. 5. 6. 7. 8. 9. 10. Definitely 11. Refused / Don't Know
Understanding	In your opinion, is this nutrition information **easy to understand**? 1. Not at all 2. 3. 4. 5. 6. 7. 8.

	9. 10. Definitely 11. Refused / Don't Know
Perceived effectiveness	In your opinion, would this type of nutrition information **help you choose healthier foods**? 1. Not at all 2. 3. 4. 5. 6. 7. 8. 9. 10. Definitely 11. Refused / Don't Know
Ranking task	[Programmer note: use tobacco survey as template, randomize presentation/placement of symbols on screen] Overall, which type of nutrition information do you think would be **most effective** in helping people choose healthier foods? [Show all four on screen at once] What is the **next most effective** type of nutrition information?
	[Repeat both sets for the remaining three nutrition information]

SOCIO-DEMOGRAPHIC INFORMATION	
	Before we finish the survey, we have a few more questions about your background:
Label Use *(Use of nutritional info while shopping)*	When shopping for food, do you usually look at the nutrition information provided on the package? 1. Never 2. Almost never 3. Sometimes

	4. Usually 5. Always 6. Refused 7. Don't Know
Nutrition Information Sought *(Adapted from Healthy Eating Evaluation – Health Canada Report 2008)*	When shopping for food for you and your family, what types of nutrition information provided on the food package do you usually look for? *(Select all that apply)* 1. None 2. Nutrition Facts table 3. Number of calories 4. Fat content (total) 5. Saturated fat content 6. Trans fat content 7. Sodium/salt content 8. Carbohydrate content 9. Sugar content 10. Fibre content 11. Protein content 12. Vitamin A content 13. Vitamin C content 14. Calcium content 15. Iron content 16. Health logo or symbol 17. Nutrition claims (e.g. high in fibre, low in fat) 18. Other: _____ 19. Refused 20. Don't know
Serving Size Knowledge	[Participants will be randomized to see one of six images: a bottle of coke with front label only, a bottle of coke with front label plus caloric information per container, a bottle of coke with nutrition facts table, a can of coke with front label only, a can of coke with front label plus caloric information per container, and a can of coke with nutrition facts table] How many calories are in this bottle (can) of coke? Insert number of calories: _____
Perceived Nutritional Knowledge	I am knowledgeable about health and nutrition issues. 1. Strongly disagree 2. Disagree somewhat

	3. Neutral/no opinion 4. Agree somewhat 5. Strongly agree 6. Refused 7. Don't Know
General Health *(Taken from Canadian Community Health Survey)*	In general, how would you rate your overall health? 1. Poor 2. Fair 3. Good 4. Very Good 5. Excellent 6. Refused 7. Don't Know
Medical Conditions	Do you suffer from any chronic medical conditions (such as heart disease, diabetes, high blood pressure, irritable bowel syndrome, or any other condition)? 1. No 2. Yes – please list medical condition(s):_____ 3. Refused 4. Don't Know
Height	How tall are you? ____ft ____in or _____cm
Weight	What is your weight? _____lbs or _____kg
Gender	Are you: 1. Female 2. Male 3. Refused 4. Don't Know

Marital Status	What is your marital status? Are you… 1. Married? 2. Living common-law? 3. Widowed? 4. Separated? 5. Divorced? 6. Single, never married? 7. Refused 8. Don't Know
Education	What is the highest level of education you have completed? 1. Grade school or some high school 2. Completed high school 3. Trade certificate or diploma from a vocational school or apprenticeship training 4. Non-university certificate or diploma from a community college, CEGEP, school of nursing, etc. 5. University certificate below bachelor's level 6. Bachelor's degree 7. University degree or certificate above bachelor's degree 8. Refused 9. Don't Know
Income	What is your best estimate of the total household income received by all household members, from all sources, before taxes and deductions, in the past 12 months? Was it: 1. Less than $5,000 2. $5,000 or more but less than $10,000 3. $10,000 or more but less than $15,000 4. $15,000 or more but less than $20,000 5. $20,000 or more but less than $30,000 6. $30,000 or more but less than $40,000 7. $40,000 or more but less than $50,000 8. $50,000 or more but less than $60,000 9. $60,000 or more but less than $70,000 10. $70,000 or more but less than $80,000 11. $80,000 or more but less than $90,000 12. $90,000 or more but less than $100,000 13. $100,000 or more but less than $150,000 14. $150,000 and over

	15. Refused 16. Don't Know
Ethnicity	People living in Canada come from many different cultural and racial backgrounds. Are you… 1. White? 2. Chinese? 3. South Asian (for example, East Indian, Pakistani, Sri Lankan, etc.)? 4. Black? 5. Filipino? 6. Latin American? 7. Southeast Asian (for example, Cambodian, Indonesian, Laotian, Vietnamese, etc.)? 8. Arab? 9. West Asian (for example, Afghan, Iranian, etc.)? 10. Japanese? 11. Korean? 12. Aboriginal (that is, North American Indian, Métis, or Inuit), or 13. Other – Specify:_____ 14. Refused 15. Don't Know

Feedback Information
That's all the questions we have for you today. Please take a moment to go over the following feedback information.
Thank you for participating in our study – we appreciate your help. - As we mentioned earlier, we are interested in people's opinions about children's food. - We were interested in people's opinions related to package elements, such as the use of cartoon characters, and nutrition information on packages and how they affect perceptions of product appeal, nutritional quality, intention to buy and willingness to pay for the product. - We were also interested in people's opinions related to the nutrition information: whether they like the nutrition information, find it believable, understand it, and whether it is an effective method to help consumers choose healthier food products - As a reminder, this study has been reviewed by and received ethics clearance through the Office of Research Ethics at the University of Waterloo. If you have any comments or concerns resulting from your involvement please contact either Susan Sykes in the Office of Research Ethics at 519-888-4567 ext. 36005 or ssykes@uwaterloo.ca, or Dr. David

Hammond at 519-888-4567 ext. 36462 or dhammond@uwaterloo.ca. In addition, we would be pleased to share the findings of this study with you—please contact Dr. Hammond.

- We really appreciate your participation, and hope that this has been an interesting experience for you.

Appendix D

Table 15: Linear Mixed Model Contrasts for Appeal (n=897)

Main Effects			
Condition	**Estimate**	**95% CI**	***p* value**
Standard (ref) vs. Cartoon	**0.32**	**0.094 – 0.54**	**0.0054**
Standard (ref) vs. FOP Nutrition Information	0.033	-0.19 – 0.26	0.77
Standard (ref) vs. Cartoon & FOP Nutrition Information	**0.36**	**0.13 – 0.58**	**0.0019**
Cartoon (ref) vs. FOP Nutrition Information	**-0.28**	**-0.51 – -0.060**	**0.013**
Cartoon (ref) vs. Cartoon & FOP Nutrition Information	0.038	-0.19 – 0.26	0.74
FOP Nutrition Information (ref) vs. Cartoon & FOP Nutrition Information	**0.32**	**0.098 – 0.55**	**0.0048**
Product	**Estimate**	**95% CI**	***p* value**
Heinz spaghetti (ref) vs. Aunt Jemima Pancakes	**1.75**	**1.53 – 1.98**	**<0.0001**
Heinz spaghetti (ref) vs. Fibre Plus Granola Bars	**1.01**	**0.78 – 1.23**	**<0.0001**
Heinz spaghetti (ref) vs. PC Bran Bites	**-0.46**	**-0.69 – -0.24**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. Fibre Plus Granola Bars	**-0.74**	**-0.97 – -0.52**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. PC Bran Bites	**-2.22**	**-2.44 – -1.99**	**<0.0001**
Fibre Plus (ref) vs. PC Bran Bites	**-1.47**	**-1.69 – -1.25**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.11	-0.11 – 0.33	0.34
Order 1 (ref) vs. Order 3	**0.27**	**0.043 – 0.49**	**0.020**
Order 1 (ref) vs. Order 4	0.17	-0.053 – 0.39	0.14
Order 2 (ref) vs. Order 3	0.16	-0.065 – 0.38	0.17
Order 2 (ref) vs. Order 4	0.061	-0.16 – 0.28	0.59
Order 3 (ref) vs. Order 4	-0.097	-0.32 – 0.13	0.40
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	0.25	-0.0041 – 0.51	0.054
Age Group	**Estimate**	**95% CI**	***p* value**
18-34 (ref) vs. 35-44	-0.078	-0.33 – 0.17	0.54
18-34 (ref) vs. 45 and over	-0.24	-0.58 – 0.099	0.17
35-44 (ref) vs. 45 and over	-0.16	-0.47 – 0.15	0.31
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	**0.24**	**0.0091 – 0.46**	**0.042**
BMI Class	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	-0.46	-1.12 – 0.19	0.16

Underweight (ref) vs. Overweight	**-0.73**	**-1.39 – -0.057**	**0.033**
Underweight (ref) vs. Obese	**-0.71**	**-1.39 – -0.024**	**0.042**
Normal (ref) vs. Overweight	**-0.26**	**-0.52 – -0.0018**	**0.049**
Normal (ref) vs. Obese	-0.25	-0.55 – 0.061	0.12
Overweight (ref) vs. Obese	0.016	-0.30 – 0.33	0.92
Education Level	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.15	-0.12 – 0.43	0.28
Low (ref) vs. High	0.017	-0.29 – 0.33	0.91
Medium (ref) vs. High	-0.14	-0.40 – 0.12	0.31
Income Level	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.11	-0.17 – 0.40	0.43
Low (ref) vs. High	-0.13	-0.43 – 0.17	0.40
Medium (ref) vs. High	-0.24	-0.49 – 0.0081	0.058
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	0.26	-0.024 – 0.54	0.073
Screen Time and Shopping Habits			
Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	-1.38	-3.30 – 0.53	0.16
None (ref) vs. 1-2 hours/day	-1.17	-3.06 – 0.72	0.22
None (ref) vs. 3-4 hours/day	-1.33	-3.23 – 0.56	0.17
None (ref) vs. 5-6 hours/day	-1.20	-3.11 – 0.71	0.22
None (ref) vs. 7+ hours/day	-1.27	-3.21 – 0.66	0.20
<1 hour/day (ref) vs. 1-2 hours/day	0.21	-0.17 – 0.60	0.28
<1 hour/day (ref) vs. 3-4 hours/day	0.051	-0.35 – 0.45	0.80
<1 hour/day (ref) vs. 5-6 hours/day	0.18	-0.32 – 0.69	0.48
<1 hour/day (ref) vs. 7+ hours/day	0.11	-0.46 – 0.68	0.70
1-2 hours/day (ref) vs. 3-4 hours/day	-0.16	-0.42 – 0.096	0.22
1-2 hours/day (ref) vs. 5-6 hours/day	-0.029	-0.43 – 0.37	0.89
1-2 hours/day (ref) vs. 7+ hours/day	-0.10	-0.58 – 0.38	0.68
3-4 hours/day (ref) vs. 5-6 hours/day	0.13	-0.27 – 0.53	0.52
3-4 hours/day (ref) vs. 7+ hours/day	0.060	-0.42 – 0.54	0.81
5-6 hours/day (ref) vs. 7+ hours/day	-0.072	-0.64 – 0.50	0.80
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	**-1.30**	**-2.43 – -0.17**	**0.024**
1 time/month or less (ref) vs. 1 time/week	**-1.58**	**-2.70 – -0.45**	**0.0062**
1 time/month or less (ref) vs. >1 time/week	**-1.61**	**-2.74 – -0.48**	**0.0051**
2-3 times/month (ref) vs. 1 time/week	-0.28	-0.58 – 0.026	0.073
2-3 times/month (ref) vs. >1 time/week	**-0.31**	**-0.61 – -0.014**	**0.041**
1 time/week (ref) vs. >1 time/week	-0.037	-0.28 – 0.21	0.77
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	**2.76**	**0.82 – 4.69**	**0.0052**

Never (ref) vs. Sometimes	**3.00**	**1.09 – 4.91**	**0.0021**
Never (ref) vs. Usually	**3.02**	**1.11 – 4.93**	**0.002**
Never (ref) vs. Always	**3.30**	**1.37 – 5.22**	**0.0008**
Almost never (ref) vs. Sometimes	0.24	-0.20 – 0.69	0.28
Almost never (ref) vs. Usually	0.26	-0.19 – 0.72	0.25
Almost never (ref) vs. Always	**0.54**	**0.030 – 1.05**	**0.038**
Sometimes (ref) vs. Usually	0.020	-0.23 – 0.27	0.87
Sometimes (ref) vs. Always	0.30	-0.041 – 0.63	0.085
Usually (ref) vs. Always	0.28	-0.068 – 0.62	0.12
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.054	-2.30 – 2.41	0.96
Never (ref) vs. Sometimes	0.062	-2.28 – 2.40	0.96
Never (ref) vs. Usually	0.39	-1.95 – 2.73	0.74
Never (ref) vs. Always	0.66	-1.68 – 3.00	0.58
Almost never (ref) vs. Sometimes	0.0083	-0.46 – 0.48	0.97
Almost never (ref) vs. Usually	0.34	-0.16 – 0.83	0.18
Almost never (ref) vs. Always	**0.61**	**0.099 – 1.12**	**0.019**
Sometimes (ref) vs. Usually	**0.33**	**0.064 – 0.60**	**0.015**
Sometimes (ref) vs. Always	**0.60**	**0.30 – 0.90**	**<0.0001**
Usually (ref) vs. Always	0.27	-0.038 – 0.58	0.085
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	0.095	-0.37 – 0.56	0.69
Almost never (ref) vs. Usually	0.20	-0.34 – 0.73	0.47
Almost never (ref) vs. Always	**0.84**	**0.077 – 1.60**	**0.031**
Sometimes (ref) vs. Usually	0.10	-0.19 – 0.39	0.49
Sometimes (ref) vs. Always	**0.74**	**0.13 – 1.36**	**0.017**
Usually (ref) vs. Always	**0.64**	**0.024 – 1.26**	**0.042**
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.051	-0.75 – 0.85	0.90
Never (ref) vs. Sometimes	0.17	-0.61 – 0.95	0.67
Never (ref) vs. Usually	0.11	-0.71 – 0.93	0.79
Never (ref) vs. Always	0.32	-0.61 – 1.26	0.50
Almost never (ref) vs. Sometimes	0.12	-0.19 – 0.43	0.46
Almost never (ref) vs. Usually	0.059	-0.34 – 0.45	0.77
Almost never (ref) vs. Always	0.27	-0.33 – 0.87	0.37
Sometimes (ref) vs. Usually	-0.060	-0.35 – 0.23	0.69
Sometimes (ref) vs. Always	0.15	-0.39 – 0.70	0.55
Usually (ref) vs. Always	0.21	-0.34 – 0.77	0.45

Label Use, Nutritional Knowledge and Health Status

Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	-0.18	-1.33 – 0.98	0.76
Never (ref) vs. Sometimes	0.13	-1.06 – 1.33	0.83
Never (ref) vs. Usually	-0.025	-1.23 – 1.18	0.97

Never (ref) vs. Always	0.41	-0.81 – 1.63	0.51
Almost Never (ref) vs. Sometimes	0.31	-0.18 – 0.80	0.21
Almost Never (ref) vs. Usually	0.15	-0.35 – 0.65	0.55
Almost Never (ref) vs. Always	**0.59**	**0.063 – 1.11**	**0.028**
Sometimes (ref) vs. Usually	-0.16	-0.44 – 0.12	0.27
Sometimes (ref) vs. Always	0.28	-0.045 – 0.60	0.092
Usually (ref) vs. Always	**0.44**	**0.15 – 0.72**	**0.0028**
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	**0.92**	**0.12 – 1.72**	**0.024**
None (ref) vs. Other Nutrition Information	0.64	-0.15 – 1.43	0.11
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.28**	**-0.50 – -0.054**	**0.015**
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.36	-0.53 – 1.25	0.42
Strongly disagree (ref) vs. Neutral/no opinion	0.26	-0.54 – 1.06	0.52
Strongly disagree (ref) vs. Agree somewhat	0.49	-0.30 – 1.28	0.22
Strongly disagree (ref) vs. Strongly agree	0.14	-0.67 – 0.95	0.73
Disagree somewhat (ref) vs. Neutral/no opinion	-0.10	-0.64 – 0.44	0.72
Disagree somewhat (ref) vs. Agree somewhat	0.13	-0.39 – 0.65	0.63
Disagree somewhat (ref) vs. Strongly agree	-0.22	-0.80 – 0.36	0.45
Neutral/no opinion (ref) vs. Agree somewhat	0.23	-0.093 – 0.55	0.16
Neutral/no opinion (ref) vs. Strongly agree	-0.12	-0.52 – 0.28	0.55
Agree somewhat (ref) vs. Strongly agree	**-0.35**	**-0.64 – -0.054**	**0.020**
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	0.093	-0.84 – 1.02	0.84
Poor (ref) vs. Good	0.26	-0.63 – 1.16	0.56
Poor (ref) vs. Very Good	0.63	-0.28 – 1.54	0.18
Poor (ref) vs. Excellent	0.22	-0.79 – 1.22	0.67
Fair (ref) vs. Good	0.17	-0.21 – 0.55	0.38
Fair (ref) vs. Very Good	**0.54**	**0.12 – 0.95**	**0.011**
Fair (ref) vs. Excellent	0.12	-0.47 – 0.72	0.69
Good (ref) vs. Very Good	**0.37**	**0.11 – 0.62**	**0.0048**
Good (ref) vs. Excellent	-0.047	-0.55 – 0.45	0.85
Very Good (ref) vs. Excellent	-0.41	-0.90 – 0.072	0.095
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	**0.30**	**0.0075 – 0.59**	**0.044**

Table 16: Linear Mixed Model Contrasts for Nutritional Quality (n=897)

	Main Effects		
Condition	**Estimate**	**95% CI**	***p* value**
Standard (ref) vs. Cartoon	-0.13	-0.28 – 0.024	0.099

Standard (ref) vs. FOP Nutrition Information	**0.22**	**0.065 – 0.37**	**0.0053**
Standard (ref) vs. Cartoon & FOP Nutrition Information	**0.16**	**0.0039 – 0.31**	**0.044**
Cartoon (ref) vs. FOP Nutrition Information	**0.35**	**0.19 – 0.50**	**<0.0001**
Cartoon (ref) vs. Cartoon & FOP Nutrition Information	**0.29**	**0.13 – 0.44**	**0.0003**
FOP Nutrition Information (ref) vs. Cartoon & FOP Nutrition Information	-0.061	-0.22 – 0.092	0.43
Product	**Estimate**	**95% CI**	***p* value**
Heinz spaghetti (ref) vs. Aunt Jemima Pancakes	**1.11**	**0.96 – 1.27**	**<0.0001**
Heinz spaghetti (ref) vs. Fibre Plus Granola Bars	**2.18**	**2.02 – 2.33**	**<0.0001**
Heinz spaghetti (ref) vs. PC Bran Bites	**2.68**	**2.52 – 2.83**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. Fibre Plus Granola Bars	**1.07**	**0.91 – 1.22**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. PC Bran Bites	**1.57**	**1.41 – 1.72**	**<0.0001**
Fibre Plus Granola Bars (ref) vs. PC Bran Bites	**0.50**	**0.35 – 0.66**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.022	-0.13 – 0.18	0.78
Order 1 (ref) vs. Order 3	0.0041	-0.15 – 0.16	0.96
Order 1 (ref) vs. Order 4	-0.11	-0.27 – 0.039	0.14
Order 2 (ref) vs. Order 3	-0.018	-0.17 – 0.14	0.82
Order 2 (ref) vs. Order 4	-0.14	-0.29 – 0.018	0.083
Order 3 (ref) vs. Order 4	-0.12	-0.27 – 0.036	0.13
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	0.025	-0.22 – 0.27	0.84
Age Group	**Estimate**	**95% CI**	***p* value**
18-34 (ref) vs. 35-44	0.16	-0.082 – 0.40	0.20
18-34 (ref) vs. 45 and over	0.27	-0.056 – 0.60	0.10
35-44 (ref) vs. 45 and over	0.11	-0.19 – 0.41	0.46
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.034	-0.25 – 0.19	0.76
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	-0.14	-0.77 – 0.49	0.67
Underweight (ref) vs. Overweight	-0.083	-0.73 – 0.56	0.80
Underweight (ref) vs. Obese	0.047	-0.61 – 0.71	0.89
Normal (ref) vs. Overweight	0.054	-0.20 – 0.30	0.67
Normal (ref) vs. Obese	0.18	-0.11 – 0.48	0.22
Overweight (ref) vs. Obese	0.13	-0.18 – 0.44	0.41
Education	**Estimate**	**95% CI**	***p* value**

Low (ref) vs. Medium	0.11	-0.16 – 0.37	0.43
Low (ref) vs. High	-0.12	-0.42 – 0.18	0.44
Medium (ref) vs. High	-0.22	-0.48 – 0.027	0.080
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.15	-0.43 – 0.12	0.27
Low (ref) vs. High	-0.24	-0.53 – 0.050	0.10
Medium (ref) vs. High	-0.085	-0.33 – 0.16	0.49
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	0.16	-0.11 – 0.43	0.26

Screen Time and Shopping Habits

Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	-0.64	-2.49 – 1.21	0.50
None (ref) vs. 1-2 hours/day	0.058	-1.77 – 1.88	0.95
None (ref) vs. 3-4 hours/day	0.062	-1.76 – 1.89	0.95
None (ref) vs. 5-6 hours/day	0.053	-1.79 – 1.89	0.96
None (ref) vs. 7+ hours/day	0.027	-1.84 – 1.89	0.98
<1 hour/day (ref) vs. 1-2 hours/day	**0.70**	**0.32 – 1.07**	**0.0003**
<1 hour/day (ref) vs. 3-4 hours/day	**0.70**	**0.31 – 1.09**	**0.0004**
<1 hour/day (ref) vs. 5-6 hours/day	**0.69**	**0.20 – 1.18**	**0.0054**
<1 hour/day (ref) vs. 7+ hours/day	**0.67**	**0.11 – 1.22**	**0.018**
1-2 hours/day (ref) vs. 3-4 hours/day	0.0045	-0.24 – 0.25	0.97
1-2 hours/day (ref) vs. 5-6 hours/day	-0.0048	-0.39 – 0.38	0.98
1-2 hours/day (ref) vs. 7+ hours/day	-0.031	-0.50 – 0.43	0.90
3-4 hours/day (ref) vs. 5-6 hours/day	-0.0093	-0.40 – 0.38	0.96
3-4 hours/day (ref) vs. 7+ hours/day	-0.035	-0.50 – 0.43	0.88
5-6 hours/day (ref) vs. 7+ hours/day	-0.026	-0.57 – 0.52	0.93
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	-0.67	-1.77 – 0.42	0.23
1 time/month or less (ref) vs. 1 time/week	-1.04	-2.13 – 0.045	0.060
1 time/month or less (ref) vs. >1 time/week	-1.08	-2.17 – 0.0057	0.051
2-3 times/month (ref) vs. 1 time/week	**-0.37**	**-0.66 – 0.081**	**0.012**
2-3 times/month (ref) vs. >1 time/week	**-0.41**	**-0.70 – -0.12**	**0.0052**
1 time/week (ref) vs. >1 time/week	-0.039	-0.28 – 0.20	0.74
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.59	-1.28 – 2.45	0.54
Never (ref) vs. Sometimes	0.87	-0.97 – 2.71	0.36
Never (ref) vs. Usually	0.84	-1.01 – 2.69	0.37
Never (ref) vs. Always	1.02	-0.83 – 2.88	0.28
Almost never (ref) vs. Sometimes	0.28	-0.15 – 0.71	0.20
Almost never (ref) vs. Usually	0.25	-0.18 – 0.69	0.25
Almost never (ref) vs. Always	0.43	-0.058 – 0.93	0.084

Sometimes (ref) vs. Usually	-0.028	-0.27 – 0.21	0.82
Sometimes (ref) vs. Always	0.15	-0.17 – 0.48	0.36
Usually (ref) vs. Always	0.18	-0.15 – 0.51	0.29
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.014	-2.29 – 2.26	0.99
Never (ref) vs. Sometimes	0.20	-2.05 – 2.46	0.86
Never (ref) vs. Usually	0.41	-1.85 – 2.67	0.72
Never (ref) vs. Always	0.60	-1.67 – 2.86	0.61
Almost never (ref) vs. Sometimes	0.22	-0.24 – 0.67	0.35
Almost never (ref) vs. Usually	0.42	-0.056 – 0.90	0.084
Almost never (ref) vs. Always	**0.61**	**0.12 – 1.10**	**0.015**
Sometimes (ref) vs. Usually	0.20	-0.053 – 0.46	0.12
Sometimes (ref) vs. Always	**0.39**	**0.11 – 0.68**	**0.0073**
Usually (ref) vs. Always	0.19	-0.11 – 0.49	0.21
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	**0.75**	**0.30 – 1.20**	**0.0012**
Almost never (ref) vs. Usually	**1.35**	**0.84 – 1.87**	**<0.0001**
Almost never (ref) vs. Always	**1.65**	**0.91 – 2.38**	**<0.0001**
Sometimes (ref) vs. Usually	**0.60**	**0.33 – 0.88**	**<0.0001**
Sometimes (ref) vs. Always	**0.90**	**0.31 – 1.49**	**0.003**
Usually (ref) vs. Always	0.29	-0.31 – 0.89	0.34
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.52	-1.29 – 0.25	0.19
Never (ref) vs. Sometimes	-0.23	-0.98 – 0.53	0.56
Never (ref) vs. Usually	-0.14	-0.93 – 0.65	0.73
Never (ref) vs. Always	0.50	-0.40 – 1.40	0.28
Almost never (ref) vs. Sometimes	0.29	-0.012 – 0.59	0.067
Almost never (ref) vs. Usually	0.38	-0.0013 – 0.76	0.051
Almost never (ref) vs. Always	**1.02**	**0.44 – 1.60**	**0.0006**
Sometimes (ref) vs. Usually	0.089	-0.19 – 0.37	0.54
Sometimes (ref) vs. Always	**0.73**	**0.20 – 1.25**	**0.0065**
Usually (ref) vs. Always	**0.64**	**0.10 – 1.17**	**0.019**

Label Use, Nutritional Knowledge and Health Status

Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	-0.32	-1.44 – 0.80	0.57
Never (ref) vs. Sometimes	-0.25	-1.40 – 0.91	0.67
Never (ref) vs. Usually	-0.64	-1.80 – 0.53	0.28
Never (ref) vs. Always	-0.62	-1.79 – 0.56	0.30
Almost Never (ref) vs. Sometimes	0.070	-0.40 – 0.54	0.77
Almost Never (ref) vs. Usually	-0.32	-0.80 – 0.17	0.20
Almost Never (ref) vs. Always	-0.30	-0.80 – 0.21	0.25
Sometimes (ref) vs. Usually	**-0.39**	**-0.66 – -0.12**	**0.005**
Sometimes (ref) vs. Always	**-0.37**	**-0.68 – -0.053**	**0.022**

Usually (ref) vs. Always	0.020	-0.26 – 0.30	0.89
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	**1.04**	**0.27 – 1.82**	**0.0081**
None (ref) vs. Other Nutrition Information	0.58	-0.19 – 1.34	0.14
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.47**	**-0.68 – -0.25**	**<0.0001**
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.74	-0.11 – 1.60	0.089
Strongly disagree (ref) vs. Neutral/no opinion	**0.80**	**0.025 – 1.57**	**0.043**
Strongly disagree (ref) vs. Agree somewhat	0.71	-0.046 – 1.47	0.066
Strongly disagree (ref) vs. Strongly agree	0.43	-0.36 – 1.21	0.29
Disagree somewhat (ref) vs. Neutral/no opinion	0.054	-0.47 – 0.58	0.84
Disagree somewhat (ref) vs. Agree somewhat	-0.031	-0.53 – 0.47	0.90
Disagree somewhat (ref) vs. Strongly agree	-0.32	-0.88 – 0.24	0.26
Neutral/no opinion (ref) vs. Agree somewhat	-0.085	-0.39 – 0.22	0.59
Neutral/no opinion (ref) vs. Strongly agree	-0.37	-0.76 – 0.013	0.058
Agree somewhat (ref) vs. Strongly agree	**-0.29**	**-0.57 – -0.0041**	**0.047**
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	-0.13	-1.03 – 0.77	0.77
Poor (ref) vs. Good	0.20	-0.67 – 1.06	0.65
Poor (ref) vs. Very Good	0.41	-0.46 – 1.29	0.35
Poor (ref) vs. Excellent	0.22	-0.75 – 1.19	0.66
Fair (ref) vs. Good	0.33	-0.035 – 0.69	0.077
Fair (ref) vs. Very Good	**0.55**	**0.15 – 0.94**	**0.007**
Fair (ref) vs. Excellent	0.35	-0.22 – 0.93	0.23
Good (ref) vs. Very Good	0.22	-0.028 – 0.46	0.082
Good (ref) vs. Excellent	0.024	-0.46 – 0.51	0.92
Very Good (ref) vs. Excellent	-0.19	-0.66 – 0.27	0.42
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	0.23	-0.054 – 0.51	0.11

Table 17: Linear Mixed Model Contrasts for Intention to Buy (n=897)

	Main Effects		
Condition	**Estimate**	**95% CI**	***p* value**
Standard (ref) vs. Cartoon	0.030	-0.18 – 0.24	0.78
Standard (ref) vs. FOP Nutrition Information	0.19	-0.023 – 0.40	0.08
Standard (ref) vs. Cartoon & FOP Nutrition Information	0.20	-0.0055 – 0.42	0.056
Cartoon (ref) vs. FOP Nutrition Information	0.16	-0.053 – 0.37	0.14
Cartoon (ref) vs. Cartoon & FOP Nutrition Information	0.18	-0.036 – 0.39	0.10

FOP Nutrition Information (ref) vs. Cartoon & FOP Nutrition Information	0.017	-0.19 – 0.23	0.87
Product	**Estimate**	**95% CI**	***p* value**
Heinz spaghetti (ref) vs. Aunt Jemima Pancakes	**1.45**	**1.24 – 1.66**	**<0.0001**
Heinz spaghetti (ref) vs. Fibre Plus Granola Bars	**1.73**	**1.52 – 1.94**	**<0.0001**
Heinz spaghetti (ref) vs. PC Bran Bites	**1.20**	**0.99 – 1.41**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. Fibre Plus Granola Bars	**0.28**	**0.074 – 0.50**	**0.0081**
Aunt Jemima Pancakes (ref) vs. PC Bran Bites	**-0.24**	**-0.45 – -0.034**	**0.023**
Fibre Plus Granola Bars (ref) vs. PC Bran Bites	**-0.53**	**-0.74 – -0.32**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.11	-0.10 – 0.32	0.30
Order 1 (ref) vs. Order 3	0.18	-0.031 – 0.39	0.094
Order 1 (ref) vs. Order 4	-0.0015	-0.21 – 0.21	0.99
Order 2 (ref) vs. Order 3	0.070	-0.14 – 0.28	0.51
Order 2 (ref) vs. Order 4	-0.11	-0.32 – 0.098	0.30
Order 3 (ref) vs. Order 4	-0.18	-0.39 – 0.028	0.09
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	0.25	-0.034 – 0.54	0.084
Age Group	**Estimate**	**95% CI**	***p* value**
18-34 (ref) vs. 35-44	0.030	-0.24 – 0.30	0.83
18-34 (ref) vs. 45 and over	-0.16	-0.53 – 0.21	0.39
35-44 (ref) vs. 45 and over	-0.19	-0.53 – 0.15	0.27
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.0042	-0.25 – 0.25	0.97
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	-0.091	-0.81 – 0.63	0.80
Underweight (ref) vs. Overweight	-0.25	-0.99 – 0.48	0.50
Underweight (ref) vs. Obese	-0.29	-1.05 – 0.47	0.45
Normal (ref) vs. Overweight	-0.16	-0.45 – 0.12	0.26
Normal (ref) vs. Obese	-0.20	-0.54 – 0.14	0.25
Overweight (ref) vs. Obese	-0.036	-0.39 – 0.32	0.84
Education	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.19	-0.12 – 0.49	0.23
Low (ref) vs. High	-0.23	-0.57 – 0.11	0.19
Medium (ref) vs. High	**-0.42**	**-0.70 – -0.13**	**0.0045**
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.16	-0.47 – 0.16	0.33

Low (ref) vs. High	**-0.37**	**-0.70 – -0.039**	**0.029**
Medium (ref) vs. High	-0.21	-0.49 – 0.063	0.13
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	0.21	-0.098 – 0.52	0.18
Screen Time and Shopping Habits			
Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	-1.44	-3.55 – 0.67	0.18
None (ref) vs. 1-2 hours/day	-0.64	-2.72 – 1.45	0.55
None (ref) vs. 3-4 hours/day	-0.71	-2.80 – 1.37	0.50
None (ref) vs. 5-6 hours/day	-0.58	-2.68 – 1.52	0.59
None (ref) vs. 7+ hours/day	-0.54	-2.67 – 1.60	0.62
<1 hour/day (ref) vs. 1-2 hours/day	**0.80**	**0.37 – 1.23**	**0.0002**
<1 hour/day (ref) vs. 3-4 hours/day	**0.72**	**0.28 – 1.17**	**0.0014**
<1 hour/day (ref) vs. 5-6 hours/day	**0.86**	**0.30 – 1.41**	**0.0026**
<1 hour/day (ref) vs. 7+ hours/day	**0.90**	**0.27 – 1.53**	**0.0051**
1-2 hours/day (ref) vs. 3-4 hours/day	-0.076	-0.36 – 0.21	0.60
1-2 hours/day (ref) vs. 5-6 hours/day	0.057	-0.38 – 0.50	0.80
1-2 hours/day (ref) vs. 7+ hours/day	0.10	-0.43 – 0.63	0.71
3-4 hours/day (ref) vs. 5-6 hours/day	0.13	-0.31 – 0.58	0.55
3-4 hours/day (ref) vs. 7+ hours/day	0.18	-0.35 – 0.70	0.51
5-6 hours/day (ref) vs. 7+ hours/day	0.043	-0.58 – 0.67	0.89
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	**-1.26**	**-2.52 – -0.0063**	**0.049**
1 time/month or less (ref) vs. 1 time/week	**-1.51**	**-2.76 – -0.26**	**0.018**
1 time/month or less (ref) vs. >1 time/week	**-1.45**	**-2.70 – -0.19**	**0.024**
2-3 times/month (ref) vs. 1 time/week	-0.25	-0.58 – 0.083	0.14
2-3 times/month (ref) vs. >1 time/week	-0.18	-0.51 – 0.15	0.28
1 time/week (ref) vs. >1 time/week	0.067	-0.20 – 0.34	0.63
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	1.29	-0.88 – 3.47	0.24
Never (ref) vs. Sometimes	1.77	-0.38 – 3.92	0.11
Never (ref) vs. Usually	1.74	-0.41 – 3.90	0.11
Never (ref) vs. Always	1.83	-0.33 – 3.99	0.097
Almost never (ref) vs. Sometimes	0.46	-0.012 – 0.96	0.056
Almost never (ref) vs. Usually	0.45	-0.047 – 0.95	0.076
Almost never (ref) vs. Always	0.54	-0.025 – 1.10	0.061
Sometimes (ref) vs. Usually	-0.025	-0.30 – 0.25	0.86
Sometimes (ref) vs. Always	0.061	-0.31 – 0.43	0.75
Usually (ref) vs. Always	0.086	-0.29 – 0.47	0.66
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.76	-3.36 – 1.84	0.57
Never (ref) vs. Sometimes	-0.35	-2.93 – 2.23	0.79

Never (ref) vs. Usually	0.023	-2.56 – 2.61	0.99
Never (ref) vs. Always	0.30	-2.29 – 2.88	0.82
Almost never (ref) vs. Sometimes	0.41	-0.11 – 0.93	0.12
Almost never (ref) vs. Usually	**0.78**	**0.24 – 1.33**	**0.0048**
Almost never (ref) vs. Always	**1.06**	**0.50 – 1.62**	**0.0002**
Sometimes (ref) vs. Usually	**0.38**	**0.081 – 0.67**	**0.012**
Sometimes (ref) vs. Always	**0.65**	**0.32 – 0.98**	**0.0001**
Usually (ref) vs. Always	0.27	-0.063 – 0.61	0.11
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	**0.72**	**0.20 – 1.23**	**0.0066**
Almost never (ref) vs. Usually	**1.39**	**0.80 – 1.97**	**<0.0001**
Almost never (ref) vs. Always	**2.31**	**1.47 – 3.15**	**<0.0001**
Sometimes (ref) vs. Usually	**0.67**	**0.35 – 0.98**	**<0.0001**
Sometimes (ref) vs. Always	**1.59**	**0.91 – 2.27**	**<0.0001**
Usually (ref) vs. Always	**0.92**	**0.24 – 1.61**	**0.0084**
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.30	-1.18 – 0.58	0.50
Never (ref) vs. Sometimes	0.041	-0.82 – 0.90	0.93
Never (ref) vs. Usually	0.082	-0.82 – 0.98	0.86
Never (ref) vs. Always	0.16	-0.87 – 1.20	0.75
Almost never (ref) vs. Sometimes	0.34	-0.0035 – 0.69	0.052
Almost never (ref) vs. Usually	0.38	-0.052 – 0.82	0.084
Almost never (ref) vs. Always	0.46	-0.20 – 1.13	0.17
Sometimes (ref) vs. Usually	0.041	-0.28 – 0.37	0.80
Sometimes (ref) vs. Always	0.12	-0.48 – 0.72	0.69
Usually (ref) vs. Always	0.082	-0.53 – 0.69	0.79
Label Use, Nutritional Knowledge and Health Status			
Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	0.59	-0.69 – 1.86	0.37
Never (ref) vs. Sometimes	0.77	-0.55 – 2.09	0.25
Never (ref) vs. Usually	0.44	-0.89 – 1.77	0.52
Never (ref) vs. Always	0.55	-0.79 – 1.90	0.42
Almost Never (ref) vs. Sometimes	0.18	-0.36 – 0.72	0.51
Almost Never (ref) vs. Usually	-0.15	-0.70 – 0.40	0.59
Almost Never (ref) vs. Always	-0.035	-0.61 – 0.55	0.91
Sometimes (ref) vs. Usually	**-0.33**	**-0.64 – -0.023**	**0.035**
Sometimes (ref) vs. Always	-0.21	-0.57 – 0.14	0.24
Usually (ref) vs. Always	0.11	-0.20 – 0.43	0.48
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	0.72	-0.16 – 1.60	0.11
None (ref) vs. Other Nutrition Information	0.15	-0.72 – 1.02	0.74
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.57**	**-0.82 – -0.33**	**<0.0001**

Perceived Nutritional Knowledge	Estimate	95% CI	*p* value
Strongly disagree (ref) vs. Disagree somewhat	0.81	-0.17 – 1.79	0.10
Strongly disagree (ref) vs. Neutral/no opinion	**1.06**	**0.18 – 1.95**	**0.018**
Strongly disagree (ref) vs. Agree somewhat	**1.02**	**0.15 – 1.89**	**0.021**
Strongly disagree (ref) vs. Strongly agree	0.59	-0.31 – 1.48	0.20
Disagree somewhat (ref) vs. Neutral/no opinion	0.25	-0.35 – 0.85	0.41
Disagree somewhat (ref) vs. Agree somewhat	0.21	-0.37 – 0.78	0.48
Disagree somewhat (ref) vs. Strongly agree	-0.22	-0.86 – 0.41	0.49
Neutral/no opinion (ref) vs. Agree somewhat	-0.043	-0.40 – 0.31	0.81
Neutral/no opinion (ref) vs. Strongly agree	**-0.47**	**-0.91 – -0.033**	**0.035**
Agree somewhat (ref) vs. Strongly agree	**-0.43**	**-0.76 – -0.11**	**0.0094**
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	-0.067	-1.09 – 0.96	0.90
Poor (ref) vs. Good	0.020	-0.97 – 1.01	0.97
Poor (ref) vs. Very Good	0.33	-0.67 – 1.34	0.52
Poor (ref) vs. Excellent	0.16	-0.95 – 1.27	0.78
Fair (ref) vs. Good	0.087	-0.33 – 0.50	0.68
Fair (ref) vs. Very Good	0.40	-0.053 – 0.85	0.084
Fair (ref) vs. Excellent	0.23	-0.43 – 0.88	0.50
Good (ref) vs. Very Good	**0.31**	**0.033 – 0.59**	**0.029**
Good (ref) vs. Excellent	0.14	-0.41 – 0.69	0.62
Very Good (ref) vs. Excellent	-0.17	-0.71 – 0.36	0.52
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	0.29	-0.029 – 0.61	0.075

Table 18: Linear Mixed Model Contrasts for Willingness to Pay (n=897)

Main Effects			
Condition	**Estimate**	**95% CI**	***p* value**
Standard (ref) vs. Cartoon	0.0016	-0.072 – 0.075	0.97
Standard (ref) vs. FOP Nutrition Information	0.058	-0.015 – 0.13	0.12
Standard (ref) vs. Cartoon & FOP Nutrition Information	0.034	-0.039 – 0.11	0.36
Cartoon (ref) vs. FOP Nutrition Information	0.057	-0.017 – 0.13	0.13
Cartoon (ref) vs. Cartoon & FOP Nutrition Information	0.033	-0.041 – 0.11	0.38
FOP Nutrition Information (ref) vs. Cartoon & FOP Nutrition Information	-0.024	-0.097 – 0.050	0.52
Product	**Estimate**	**95% CI**	***p* value**
Heinz spaghetti (ref) vs. Aunt Jemima Pancakes	**1.37**	**1.29 – 1.44**	**<0.0001**
Heinz spaghetti (ref) vs. Fibre Plus Granola Bars	**1.28**	**1.20 – 1.35**	**<0.0001**
Heinz spaghetti (ref) vs. PC Bran Bites	**1.05**	**0.98 – 1.12**	**<0.0001**
Aunt Jemima Pancakes (ref) vs. Fibre Plus Granola	**-0.091**	**-0.16 – -0.017**	**0.016**

Bars			
Aunt Jemima Pancakes (ref) vs. PC Bran Bites	**-0.32**	**-0.39 – -0.24**	**<0.0001**
Fibre Plus Granola Bars (ref) vs. PC Bran Bites	**-0.23**	**-0.30 – -0.15**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.0068	-0.067 – 0.080	0.86
Order 1 (ref) vs. Order 3	-0.0089	-0.083 – 0.065	0.81
Order 1 (ref) vs. Order 4	**-0.085**	**-0.16 – -0.012**	**0.023**
Order 2 (ref) vs. Order 3	-0.016	-0.089 – 0.058	0.68
Order 2 (ref) vs. Order 4	**-0.092**	**-0.17 – -0.019**	**0.014**
Order 3 (ref) vs. Order 4	**-0.076**	**-0.15 – -0.0027**	**0.042**
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	**0.24**	**0.12 – 0.35**	**<0.0001**
Age Group	**Estimate**	**95% CI**	***p* value**
18-34 (ref) vs. 35-44	**-0.14**	**-0.25 – -0.024**	**0.017**
18-34 (ref) vs. 45 and over	**-0.20**	**-0.36 – -0.052**	**0.0084**
35-44 (ref) vs. 45 and over	-0.069	-0.21 – 0.071	0.33
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.068	-0.17 – 0.034	0.19
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	**-0.47**	**-0.77 – -0.18**	**0.0016**
Underweight (ref) vs. Overweight	**-0.46**	**-0.76 – -0.16**	**0.0029**
Underweight (ref) vs. Obese	**-0.57**	**-0.88 – -0.26**	**0.0003**
Normal (ref) vs. Overweight	0.017	-0.10 – 0.13	0.77
Normal (ref) vs. Obese	-0.096	-0.23 – 0.042	0.17
Overweight (ref) vs. Obese	-0.11	-0.26 – 0.030	0.12
Education	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.11	-0.012 – 0.24	0.077
Low (ref) vs. High	0.038	-0.10 – 0.18	0.59
Medium (ref) vs. High	-0.074	-0.19 – 0.043	0.22
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.048	-0.18 – 0.080	0.46
Low (ref) vs. High	0.12	-0.018 – 0.25	0.089
Medium (ref) vs. High	**0.17**	**0.052 – 0.28**	**0.0042**
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	0.051	-0.075 – 0.18	0.42
Screen Time and Shopping Habits			
Screen Time	**Estimate**	**95% CI**	***p* value**

None (ref) vs. <1 hour/day	0.11	-0.75 – 0.97	0.81
None (ref) vs. 1-2 hours/day	0.25	-0.60 – 1.10	0.56
None (ref) vs. 3-4 hours/day	0.33	-0.52 – 1.18	0.45
None (ref) vs. 5-6 hours/day	0.33	-0.53 – 1.19	0.45
None (ref) vs. 7+ hours/day	0.54	-0.33 – 1.41	0.22
<1 hour/day (ref) vs. 1-2 hours/day	0.14	-0.031 – 0.32	0.11
<1 hour/day (ref) vs. 3-4 hours/day	**0.22**	**0.040 – 0.40**	**0.017**
<1 hour/day (ref) vs. 5-6 hours/day	0.22	-0.0041 – 0.45	0.054
<1 hour/day (ref) vs. 7+ hours/day	**0.43**	**0.17 – 0.69**	**0.001**
1-2 hours/day (ref) vs. 3-4 hours/day	0.079	-0.037 – 0.19	0.18
1-2 hours/day (ref) vs. 5-6 hours/day	0.080	-0.099 – 0.26	0.38
1-2 hours/day (ref) vs. 7+ hours/day	**0.29**	**0.072 – 0.51**	**0.009**
3-4 hours/day (ref) vs. 5-6 hours/day	0.0018	-0.17 – 0.18	0.98
3-4 hours/day (ref) vs. 7+ hours/day	0.21	-0.0046 – 0.43	0.055
5-6 hours/day (ref) vs. 7+ hours/day	0.21	-0.047 – 0.46	0.11
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	0.0079	-0.50 – 0.52	0.98
1 time/month or less (ref) vs. 1 time/week	-0.0091	-0.52 – 0.50	0.97
1 time/month or less (ref) vs. >1 time/week	0.060	-0.45 – 0.57	0.82
2-3 times/month (ref) vs. 1 time/week	-0.017	-0.15 – 0.12	0.81
2-3 times/month (ref) vs. >1 time/week	0.052	-0.082 – 0.19	0.45
1 time/week (ref) vs. >1 time/week	0.069	-0.041 – 0.18	0.22
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.098	-0.77 – 0.97	0.82
Never (ref) vs. Sometimes	0.20	-0.66 – 1.06	0.65
Never (ref) vs. Usually	0.24	-0.62 – 1.10	0.59
Never (ref) vs. Always	0.22	-0.65 – 1.08	0.62
Almost never (ref) vs. Sometimes	0.10	-0.095 – 0.30	0.31
Almost never (ref) vs. Usually	0.14	-0.065 – 0.34	0.18
Almost never (ref) vs. Always	0.12	-0.11 – 0.35	0.31
Sometimes (ref) vs. Usually	0.035	-0.076 – 0.15	0.54
Sometimes (ref) vs. Always	0.016	-0.14 – 0.17	0.83
Usually (ref) vs. Always	-0.018	-0.17 – 0.14	0.82
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.93	-1.99 – 0.12	0.084
Never (ref) vs. Sometimes	-0.84	-1.89 – 0.21	0.12
Never (ref) vs. Usually	-0.76	-1.81 – 0.29	0.16
Never (ref) vs. Always	-0.75	-1.80 – 0.30	0.16
Almost never (ref) vs. Sometimes	0.094	-0.12 – 0.30	0.38
Almost never (ref) vs. Usually	0.17	-0.048 – 0.40	0.12
Almost never (ref) vs. Always	0.18	-0.047 – 0.41	0.12
Sometimes (ref) vs. Usually	0.08	-0.040 – 0.20	0.19
Sometimes (ref) vs. Always	0.088	-0.046 – 0.22	0.20
Usually (ref) vs. Always	0.0079	-0.13 – 0.15	0.91

Buy Food Products for Children	Estimate	95% CI	*p* value
Almost never (ref) vs. Sometimes	**0.21**	**0.0016 – 0.42**	**0.048**
Almost never (ref) vs. Usually	**0.38**	**0.15 – 0.62**	**0.0016**
Almost never (ref) vs. Always	**0.54**	**0.20 – 0.88**	**0.0019**
Sometimes (ref) vs. Usually	**0.17**	**0.044 – 0.30**	**0.0084**
Sometimes (ref) vs. Always	**0.33**	**0.054 – 0.61**	**0.019**
Usually (ref) vs. Always	0.16	-0.12 – 0.44	0.27
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.14	-0.22 – 0.50	0.44
Never (ref) vs. Sometimes	**0.37**	**0.015 – 0.72**	**0.041**
Never (ref) vs. Usually	**0.42**	**0.048 – 0.78**	**0.027**
Never (ref) vs. Always	**0.44**	**0.015 – 0.86**	**0.042**
Almost never (ref) vs. Sometimes	**0.22**	**0.084 – 0.37**	**0.0018**
Almost never (ref) vs. Usually	**0.27**	**0.098 – 0.45**	**0.0024**
Almost never (ref) vs. Always	**0.29**	**0.025 – 0.56**	**0.032**
Sometimes (ref) vs. Usually	0.050	-0.082 – 0.18	0.46
Sometimes (ref) vs. Always	0.070	-0.17 – 0.31	0.57
Usually (ref) vs. Always	0.020	-0.23 – 0.27	0.88

Label Use, Nutritional Knowledge and Health Status

Label Use	Estimate	95% CI	*p* value
Never (ref) vs. Almost Never	0.45	-0.066 – 0.97	0.087
Never (ref) vs. Sometimes	0.34	-0.19 – 0.88	0.21
Never (ref) vs. Usually	0.33	-0.21 – 0.87	0.23
Never (ref) vs. Always	0.22	-0.32 – 0.77	0.42
Almost Never (ref) vs. Sometimes	-0.11	-0.33 – 0.11	0.33
Almost Never (ref) vs. Usually	-0.12	-0.35 – 0.10	0.29
Almost Never (ref) vs. Always	-0.23	-0.47 – 0.0063	0.057
Sometimes (ref) vs. Usually	-0.012	-0.14 – 0.11	0.85
Sometimes (ref) vs. Always	-0.12	-0.27 – 0.025	0.11
Usually (ref) vs. Always	-0.11	-0.24 – 0.021	0.10
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	0.12	-0.24 – 0.48	0.52
None (ref) vs. Other Nutrition Information	0.12	-0.24 – 0.47	0.52
Nutrition Claims (ref) vs. Other Nutrition Information	-0.0020	-0.10 – 0.099	0.97
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.21	-0.19 – 0.61	0.29
Strongly disagree (ref) vs. Neutral/no opinion	0.24	-0.12 – 0.60	0.19
Strongly disagree (ref) vs. Agree somewhat	0.31	-0.042 – 0.67	0.084
Strongly disagree (ref) vs. Strongly agree	0.23	-0.14 – 0.59	0.22
Disagree somewhat (ref) vs. Neutral/no opinion	0.024	-0.22 – 0.27	0.85
Disagree somewhat (ref) vs. Agree somewhat	0.098	-0.14 – 0.33	0.41

Disagree somewhat (ref) vs. Strongly agree	0.016	-0.24 – 0.28	0.90
Neutral/no opinion (ref) vs. Agree somewhat	0.074	-0.070 – 0.22	0.31
Neutral/no opinion (ref) vs. Strongly agree	-0.0083	-0.19 – 0.17	0.93
Agree somewhat (ref) vs. Strongly agree	-0.082	-0.21 – 0.050	0.22
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	0.31	-0.11 – 0.72	0.15
Poor (ref) vs. Good	0.30	-0.10 – 0.70	0.15
Poor (ref) vs. Very Good	0.28	-0.12 – 0.69	0.17
Poor (ref) vs. Excellent	0.41	-0.043 – 0.86	0.076
Fair (ref) vs. Good	-0.0091	-0.18 – 0.16	0.92
Fair (ref) vs. Very Good	-0.022	-0.21 – 0.16	0.81
Fair (ref) vs. Excellent	0.10	-0.16 – 0.37	0.45
Good (ref) vs. Very Good	-0.013	-0.13 – 0.10	0.82
Good (ref) vs. Excellent	0.11	-0.11 – 0.34	0.33
Very Good (ref) vs. Excellent	0.13	-0.093 – 0.34	0.26
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	0.11	-0.024 – 0.24	0.11

Table 19: Linear Mixed Model Contrasts for Believability (n=897)

Main Effects			
Nutrition Information Type	**Estimate**	**95% CI**	***p* value**
Source of Fibre (ref) vs. Health Check	**0.85**	**0.70 – 0.99**	**<0.0001**
Source of Fibre (ref) vs. Sensible Solution	**-0.35**	**-0.49 – -0.21**	**<0.0001**
Source of Fibre (ref) vs. Given the Thumbs Up by Kids	**-0.85**	**-0.99 – -0 .71**	**<0.0001**
Health Check (ref) vs. Sensible Solution	**-1.20**	**-1.34 – -1.05**	**<0.0001**
Health Check (ref) vs. Given the Thumbs Up by Kids	**-1.69**	**-1.84 – -1.55**	**<0.0001**
Sensible Solution (ref) vs. Given the Thumbs Up by Kids	**-0.50**	**-0.64 – -0.35**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.037	-0.11 – 0.18	0.61
Order 1 (ref) vs. Order 3	0.062	-0.081 – 0.20	0.40
Order 1 (ref) vs. Order 4	-0.029	-0.17 – 0.11	0.69
Order 2 (ref) vs. Order 3	0.025	-0.12 – 0.17	0.73
Order 2 (ref) vs. Order 4	-0.066	-0.21 – 0.077	0.37
Order 3 (ref) vs. Order 4	-0.091	-0.23 – 0.052	0.21
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	-0.23	-0.49 – 0.025	0.076
Age Group	**Estimate**	**95% CI**	***p* value**

18-34 (ref) vs. 35-44	-0.024	-0.27 – 0.22	0.85
18-34 (ref) vs. 45 and over	-0.28	-0.62 – 0.053	0.099
35-44 (ref) vs. 45 and over	-0.26	-0.57 – 0.051	0.10
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.086	-0.31 – 0.14	0.46
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	-0.27	-0.92 – 0.38	0.42
Underweight (ref) vs. Overweight	-0.35	-1.02 – 0.31	0.30
Underweight (ref) vs. Obese	-0.25	-0.93 – 0.43	0.47
Normal (ref) vs. Overweight	-0.084	-0.34 – 0.17	0.52
Normal (ref) vs. Obese	0.021	-0.28 – 0.33	0.89
Overweight (ref) vs. Obese	0.11	-0.21 – 0.42	0.52
Education	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.14	-0.14 – 0.41	0.33
Low (ref) vs. High	0.0039	-0.30 – 0.31	0.98
Medium (ref) vs. High	-0.13	-0.39 – 0.13	0.32
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.16	-0.44 – 0.13	0.28
Low (ref) vs. High	-0.22	-0.51 – 0.084	0.16
Medium (ref) vs. High	-0.057	-0.31 – 0.19	0.65
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	-0.14	-0.41 – 0.14	0.34
Screen Time and Shopping Habits			
Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	0.025	-1.88 – 1.93	0.98
None (ref) vs. 1-2 hours/day	0.40	-1.48 – 2.28	0.68
None (ref) vs. 3-4 hours/day	0.54	-1.35 – 2.42	0.58
None (ref) vs. 5-6 hours/day	0.42	-1.48 – 2.32	0.67
None (ref) vs. 7+ hours/day	0.76	-1.16 – 2.69	0.44
<1 hour/day (ref) vs. 1-2 hours/day	0.37	-0.011 – 0.76	0.057
<1 hour/day (ref) vs. 3-4 hours/day	**0.51**	**0.11 – 0.91**	**0.012**
<1 hour/day (ref) vs. 5-6 hours/day	0.39	-0.11 – 0.90	0.13
<1 hour/day (ref) vs. 7+ hours/day	**0.74**	**0.17 – 1.31**	**0.011**
1-2 hours/day (ref) vs. 3-4 hours/day	0.14	-0.12 – 0.40	0.29
1-2 hours/day (ref) vs. 5-6 hours/day	0.019	-0.38 – 0.42	0.93
1-2 hours/day (ref) vs. 7+ hours/day	0.36	-0.12 – 0.84	0.14
3-4 hours/day (ref) vs. 5-6 hours/day	-0.12	-0.52 – 0.28	0.55
3-4 hours/day (ref) vs. 7+ hours/day	0.22	-0.25 – 0.70	0.36
5-6 hours/day (ref) vs. 7+ hours/day	0.34	-0.22 – 0.91	0.23
Shopping Frequency	**Estimate**	**95% CI**	***p* value**

1 time/month or less (ref) vs. 2-3 times/month	-0.90	-2.03 – 0.23	0.12
1 time/month or less (ref) vs. 1 time/week	-1.00	-2.12 – 0.13	0.083
1 time/month or less (ref) vs. >1 time/week	-1.06	-2.19 – 0.066	0.065
2-3 times/month (ref) vs. 1 time/week	-0.097	-0.40 – 0.20	0.53
2-3 times/month (ref) vs. >1 time/week	-0.16	-0.46 – 0.14	0.29
1 time/week (ref) vs. >1 time/week	-0.064	-0.31 – 0.18	0.61
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.99	-0.96 – 2.93	0.32
Never (ref) vs. Sometimes	1.01	-0.92 – 2.93	0.30
Never (ref) vs. Usually	0.86	-1.06 – 2.79	0.38
Never (ref) vs. Always	1.00	-0.94 – 2.93	0.31
Almost never (ref) vs. Sometimes	0.020	-0.42 – 0.46	0.93
Almost never (ref) vs. Usually	-0.12	-0.58 – 0.33	0.59
Almost never (ref) vs. Always	0.010	-0.50 – 0.52	0.97
Sometimes (ref) vs. Usually	-0.14	-0.39 – 0.10	0.25
Sometimes (ref) vs. Always	-0.0097	-0.35 – 0.33	0.95
Usually (ref) vs. Always	0.13	-0.21 – 0.48	0.44
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	0.55	-1.80 – 2.89	0.65
Never (ref) vs. Sometimes	0.59	-1.73 – 2.92	0.62
Never (ref) vs. Usually	0.80	-1.53 – 3.13	0.50
Never (ref) vs. Always	0.90	-1.43 – 3.24	0.45
Almost never (ref) vs. Sometimes	0.050	-0.42 – 0.52	0.83
Almost never (ref) vs. Usually	0.26	-0.24 – 0.75	0.31
Almost never (ref) vs. Always	0.36	-0.15 – 0.87	0.17
Sometimes (ref) vs. Usually	0.21	-0.060 – 0.47	0.13
Sometimes (ref) vs. Always	**0.31**	**0.010 – 0.60**	**0.043**
Usually (ref) vs. Always	0.10	-0.20 – 0.41	0.51
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	**0.68**	**0.21 – 1.15**	**0.0044**
Almost never (ref) vs. Usually	**1.15**	**0.62 – 1.68**	**<0.0001**
Almost never (ref) vs. Always	**1.44**	**0.68 – 2.20**	**0.0002**
Sometimes (ref) vs. Usually	**0.47**	**0.18 – 0.76**	**0.0012**
Sometimes (ref) vs. Always	**0.76**	**0.15 – 1.37**	**0.014**
Usually (ref) vs. Always	0.29	-0.32 – 0.91	0.35
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.48	-1.27 – 0.32	0.24
Never (ref) vs. Sometimes	-0.28	-1.06 – 0.50	0.49
Never (ref) vs. Usually	-0.16	-0.97 – 0.66	0.70
Never (ref) vs. Always	0.088	-0.84 – 1.02	0.85
Almost never (ref) vs. Sometimes	0.20	-0.11 – 0.51	0.21
Almost never (ref) vs. Usually	0.32	-0.074 – 0.71	0.11
Almost never (ref) vs. Always	0.57	-0.032 – 1.16	0.063

Sometimes (ref) vs. Usually	0.12	-0.18 – 0.41	0.43
Sometimes (ref) vs. Always	0.36	-0.18 – 0.90	0.19
Usually (ref) vs. Always	0.25	-0.30 – 0.80	0.38

Label Use, Nutritional Knowledge and Health Status

Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	0.58	-0.58 – 1.73	0.33
Never (ref) vs. Sometimes	0.35	-0.84 – 1.55	0.56
Never (ref) vs. Usually	0.14	-1.07 – 1.34	0.83
Never (ref) vs. Always	0.078	-1.14 – 1.29	0.90
Almost Never (ref) vs. Sometimes	-0.22	-0.71 – 0.26	0.37
Almost Never (ref) vs. Usually	-0.44	-0.94 – 0.057	0.083
Almost Never (ref) vs. Always	-0.50	-1.02 – 0.026	0.062
Sometimes (ref) vs. Usually	-0.22	-0.50 – 0.059	0.12
Sometimes (ref) vs. Always	-0.28	-0.60 – 0.047	0.094
Usually (ref) vs. Always	-0.057	-0.34 – 0.23	0.69
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	**1.61**	**0.81 – 2.40**	**<0.0001**
None (ref) vs. Other Nutrition Information	**0.91**	**0.12 – 1.70**	**0.023**
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.70**	**-0.92 – -0.47**	**<0.0001**
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.76	-0.12 – 1.65	0.091
Strongly disagree (ref) vs. Neutral/no opinion	0.48	-0.32 – 1.27	0.24
Strongly disagree (ref) vs. Agree somewhat	**0.79**	**0.0017 – 1.57**	**0.050**
Strongly disagree (ref) vs. Strongly agree	0.76	-0.047 – 1.57	0.065
Disagree somewhat (ref) vs. Neutral/no opinion	-0.29	-0.83 – 0.25	0.30
Disagree somewhat (ref) vs. Agree somewhat	0.022	-0.50 – 0.54	0.93
Disagree somewhat (ref) vs. Strongly agree	-0.0014	-0.58 – 0.58	0.99
Neutral/no opinion (ref) vs. Agree somewhat	0.31	-0.0095 – 0.63	0.057
Neutral/no opinion (ref) vs. Strongly agree	0.29	-0.11 – 0.68	0.16
Agree somewhat (ref) vs. Strongly agree	-0.024	-0.32 – 0.27	0.87
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	0.53	-0.40 – 1.46	0.27
Poor (ref) vs. Good	0.73	-0.16 – 1.63	0.11
Poor (ref) vs. Very Good	0.83	-0.079 – 1.74	0.073
Poor (ref) vs. Excellent	0.79	-0.22 – 1.79	0.12
Fair (ref) vs. Good	0.21	-0.17 – 0.58	0.28
Fair (ref) vs. Very Good	0.30	-0.11 – 0.71	0.15
Fair (ref) vs. Excellent	0.26	-0.33 – 0.85	0.39
Good (ref) vs. Very Good	0.098	-0.16 – 0.35	0.45
Good (ref) vs. Excellent	0.054	-0.53 – 0.44	0.83
Very Good (ref) vs. Excellent	-0.044	-0.53 – 0.44	0.86
Medical Conditions	**Estimate**	**95% CI**	***p* value**

No (ref) vs. Yes	0.062	-0.23 – 0.35	0.68

Table 20: Linear Mixed Model Contrasts for Ease of Understanding (n=897)

Main Effects			
Nutrition Information Type	**Estimate**	**95% CI**	***p* value**
Source of Fibre (ref) vs. Health Check	**0.17**	**0.014 – 0.32**	**0.033**
Source of Fibre (ref) vs. Sensible Solution	**-1.13**	**-1.29 – -0.98**	**<0.0001**
Source of Fibre (ref) vs. Given the Thumbs Up by Kids	**-0.57**	**-0.73 – -0.42**	**<0.0001**
Health Check (ref) vs. Sensible Solution	**-1.30**	**-1.46 – -1.15**	**<0.0001**
Health Check (ref) vs. Given the Thumbs Up by Kids	**-0.74**	**-0.90 – -0.58**	**<0.0001**
Sensible Solution (ref) vs. Given the Thumbs Up by Kids	**0.56**	**0.41 – 0.72**	**<0.0001**
Order	**Estimate**	**95% CI**	***p* value**
Order 1 (ref) vs. Order 2	0.087	-0.069 – 0.24	0.28
Order 1 (ref) vs. Order 3	0.072	-0.084 – 0.23	0.37
Order 1 (ref) vs. Order 4	-0.053	-0.21 – 0.10	0.50
Order 2 (ref) vs. Order 3	-0.015	-0.17 – 0.14	0.85
Order 2 (ref) vs. Order 4	-0.14	-0.30 – 0.016	0.079
Order 3 (ref) vs. Order 4	-0.12	-0.28 – 0.031	0.12
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	**-0.30**	**-0.58 – -0.021**	**0.035**
Age Group	**Estimate**	**95% CI**	***p* value**
18-34 (ref) vs. 35-44	0.0064	-0.26 – 0.27	0.96
18-34 (ref) vs. 45 and over	-0.34	-0.71 – 0.020	0.064
35-44 (ref) vs. 45 and over	**-0.35**	**-0.69 – -0.015**	**0.041**
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.095	-0.34 – 0.15	0.45
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	0.043	-0.66 – 0.75	0.91
Underweight (ref) vs. Overweight	-0.22	-0.94 – 0.50	0.55
Underweight (ref) vs. Obese	-0.17	-0.91 – 0.57	0.66
Normal (ref) vs. Overweight	-0.26	-0.54 – 0.016	0.065
Normal (ref) vs. Obese	-0.21	-0.54 – 0.12	0.21
Overweight (ref) vs. Obese	0.055	-0.29 – 0.40	0.76
Education	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.11	-0.19 – 0.41	0.47

Low (ref) vs. High	-0.20	-0.53 – 0.13	0.24
Medium (ref) vs. High	**-0.31**	**-0.59 – -0.031**	**0.030**
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.091	-0.40 – 0.22	0.56
Low (ref) vs. High	-0.17	-0.50 – 0.15	0.29
Medium (ref) vs. High	-0.082	-0.35 – 0.19	0.55
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	-0.024	-0.33 – 0.28	0.88

Screen Time and Shopping Habits

Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	-0.035	-2.10 – 2.03	0.97
None (ref) vs. 1-2 hours/day	0.14	-1.90 – 2.18	0.89
None (ref) vs. 3-4 hours/day	0.31	-1.73 – 2.35	0.77
None (ref) vs. 5-6 hours/day	0.19	-1.87 – 2.25	0.86
None (ref) vs. 7+ hours/day	0.19	-1.90 – 2.27	0.86
<1 hour/day (ref) vs. 1-2 hours/day	0.17	-0.24 – 0.59	0.41
<1 hour/day (ref) vs. 3-4 hours/day	0.34	-0.091 – 0.78	0.12
<1 hour/day (ref) vs. 5-6 hours/day	0.22	-0.32 – 0.77	0.42
<1 hour/day (ref) vs. 7+ hours/day	0.22	-0.40 – 0.84	0.48
1-2 hours/day (ref) vs. 3-4 hours/day	0.17	-0.11 – 0.45	0.23
1-2 hours/day (ref) vs. 5-6 hours/day	0.050	-0.38 – 0.48	0.82
1-2 hours/day (ref) vs. 7+ hours/day	0.047	-0.47 – 0.57	0.86
3-4 hours/day (ref) vs. 5-6 hours/day	-0.12	-0.55 – 0.31	0.59
3-4 hours/day (ref) vs. 7+ hours/day	-0.12	-0.64 – 0.39	0.64
5-6 hours/day (ref) vs. 7+ hours/day	-0.0030	-0.62 – 0.61	0.99
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	-1.09	-2.32 – 0.13	0.081
1 time/month or less (ref) vs. 1 time/week	-1.21	-2.43 – 0.013	0.053
1 time/month or less (ref) vs. >1 time/week	**-1.37**	**-2.59 – -0.15**	**0.028**
2-3 times/month (ref) vs. 1 time/week	-0.12	-0.44 – 0.21	0.48
2-3 times/month (ref) vs. >1 time/week	-0.28	-0.60 – 0.040	0.086
1 time/week (ref) vs. >1 time/week	-0.17	-0.43 – 0.099	0.22
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	1.30	-0.79 – 3.38	0.22
Never (ref) vs. Sometimes	1.27	-0.78 – 3.33	0.23
Never (ref) vs. Usually	1.25	-0.82 – 3.31	0.24
Never (ref) vs. Always	1.30	-0.77 – 3.37	0.22
Almost never (ref) vs. Sometimes	-0.021	-0.50 – 0.46	0.93
Almost never (ref) vs. Usually	-0.048	-0.54 – 0.44	0.85
Almost never (ref) vs. Always	0.0045	-0.55 – 0.55	0.99
Sometimes (ref) vs. Usually	-0.026	-0.29 – 0.24	0.85
Sometimes (ref) vs. Always	0.026	-0.34 – 0.39	0.89

Usually (ref) vs. Always	0.052	-0.32 – 0.42	0.78
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	1.30	-1.24 – 3.84	0.32
Never (ref) vs. Sometimes	1.48	-1.04 – 4.00	0.25
Never (ref) vs. Usually	1.78	-0.75 – 4.30	0.17
Never (ref) vs. Always	1.79	-0.74 – 4.31	0.17
Almost never (ref) vs. Sometimes	0.18	-0.33 – 0.68	0.49
Almost never (ref) vs. Usually	0.47	-0.061 – 1.01	0.082
Almost never (ref) vs. Always	0.48	-0.066 – 1.04	0.084
Sometimes (ref) vs. Usually	**0.30**	**0.0082 – 0.58**	**0.044**
Sometimes (ref) vs. Always	0.31	-0.015 – 0.63	0.061
Usually (ref) vs. Always	0.011	-0.32 – 0.34	0.95
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	**0.81**	**0.30 – 1.31**	**0.0017**
Almost never (ref) vs. Usually	**1.22**	**0.65 – 1.80**	**<0.0001**
Almost never (ref) vs. Always	**1.43**	**0.61 – 2.26**	**0.0006**
Sometimes (ref) vs. Usually	**0.41**	**0.10 – 0.72**	**0.0088**
Sometimes (ref) vs. Always	0.63	-0.036 – 1.29	0.064
Usually (ref) vs. Always	0.21	-0.46 – 0.88	0.53
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.82	-1.69 – 0.037	0.061
Never (ref) vs. Sometimes	**-0.93**	**-1.77 – -0.085**	**0.031**
Never (ref) vs. Usually	**-0.92**	**-1.80 – -0.035**	**0.042**
Never (ref) vs. Always	-0.72	-1.73 – 0.29	0.16
Almost never (ref) vs. Sometimes	-0.10	-0.44 – 0.24	0.55
Almost never (ref) vs. Usually	-0.092	-0.52 – 0.33	0.67
Almost never (ref) vs. Always	0.11	-0.54 – 0.75	0.74
Sometimes (ref) vs. Usually	0.011	-0.31 – 0.33	0.95
Sometimes (ref) vs. Always	0.21	-0.37 – 0.80	0.48
Usually (ref) vs. Always	0.20	-0.40 – 0.80	0.51
Label Use, Nutritional Knowledge and Health Status			
Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	0.19	-1.05 – 1.44	0.76
Never (ref) vs. Sometimes	0.033	-1.26 – 1.32	0.96
Never (ref) vs. Usually	-0.10	-1.40 – 1.20	0.88
Never (ref) vs. Always	-0.096	-1.41 – 1.22	0.89
Almost Never (ref) vs. Sometimes	-0.16	-0.69 – 0.37	0.55
Almost Never (ref) vs. Usually	-0.30	-0.84 – 0.24	0.28
Almost Never (ref) vs. Always	-0.29	-0.86 – 0.28	0.32
Sometimes (ref) vs. Usually	-0.14	-0.44 – 0.17	0.38
Sometimes (ref) vs. Always	-0.13	-0.48 – 0.22	0.47
Usually (ref) vs. Always	0.0063	-0.30 – 0.32	0.97
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**

None (ref) vs. Nutrition Claims	**1.26**	**0.40 – 2.13**	**0.0041**
None (ref) vs. Other Nutrition Information	0.59	-0.27 – 1.44	0.18
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.68**	**-0.92 – -0.44**	**<0.0001**
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.46	-0.50 – 1.42	0.35
Strongly disagree (ref) vs. Neutral/no opinion	0.35	-0.52 – 1.21	0.43
Strongly disagree (ref) vs. Agree somewhat	0.84	-0.0049 – 1.69	0.051
Strongly disagree (ref) vs. Strongly agree	**0.98**	**0.11 – 1.86**	**0.028**
Disagree somewhat (ref) vs. Neutral/no opinion	-0.11	-0.70 – 0.47	0.71
Disagree somewhat (ref) vs. Agree somewhat	0.38	-0.18 – 0.95	0.18
Disagree somewhat (ref) vs. Strongly agree	0.52	-0.098 – 1.15	0.099
Neutral/no opinion (ref) vs. Agree somewhat	**0.50**	**0.15 – 0.84**	**0.0050**
Neutral/no opinion (ref) vs. Strongly agree	**0.64**	**0.20 – 1.07**	**0.0039**
Agree somewhat (ref) vs. Strongly agree	0.14	-0.18 – 0.46	0.39
General Health	**Estimate**	**95% CI**	***p* value**
Poor (ref) vs. Fair	0.93	-0.070 – 1.94	0.068
Poor (ref) vs. Good	**1.24**	**0.28 – 2.21**	**0.012**
Poor (ref) vs. Very Good	**1.20**	**0.21 – 2.18**	**0.017**
Poor (ref) vs. Excellent	**1.55**	**0.47 – 2.64**	**0.0051**
Fair (ref) vs. Good	0.31	-0.095 – 0.72	0.13
Fair (ref) vs. Very Good	0.26	-0.18 – 0.71	0.24
Fair (ref) vs. Excellent	0.62	-0.023 – 1.26	0.059
Good (ref) vs. Very Good	-0.048	-0.32 – 0.23	0.73
Good (ref) vs. Excellent	0.31	-0.23 – 0.85	0.26
Very Good (ref) vs. Excellent	0.36	-0.17 – 0.88	0.18
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	-0.067	-0.38 – 0.25	0.68

Table 21: Linear Mixed Model Contrasts for Perceived Effectiveness (n=897)

	Main Effects		
Nutrition Information Type	**Estimate**	**95% CI**	***p* value**
Source of Fibre (ref) vs. Health Check	**0.85**	**0.70 – 1.01**	**<0.0001**
Source of Fibre (ref) vs. Sensible Solution	**-0.39**	**-0.55 – -0.23**	**<0.0001**
Source of Fibre (ref) vs. Given the Thumbs Up by Kids	**-0.42**	**-0.58 – -0.26**	**<0.0001**
Health Check (ref) vs. Sensible Solution	**-1.24**	**-1.40 – -1.08**	**<0.0001**
Health Check (ref) vs. Given the Thumbs Up by Kids	**-1.27**	**-1.43 – -1.11**	**<0.0001**
Sensible Solution (ref) vs. Given the Thumbs Up by Kids	-0.032	-0.19 – 0.13	0.69
Order	**Estimate**	**95% CI**	***p* value**

Order 1 (ref) vs. Order 2	0.045	-0.11 – 0.20	0.58
Order 1 (ref) vs. Order 3	0.054	-0.11 – 0.21	0.51
Order 1 (ref) vs. Order 4	-0.039	-0.20 – 0.12	0.63
Order 2 (ref) vs. Order 3	0.0084	-0.15 – 0.17	0.92
Order 2 (ref) vs. Order 4	-0.085	-0.24 – 0.075	0.30
Order 3 (ref) vs. Order 4	-0.093	-0.25 – 0.066	0.25
Socio-demographic Factors			
Gender	**Estimate**	**95% CI**	***p* value**
Female (ref) vs. Male	**-0.34**	**-0.64 – -0.031**	**0.031**
Age Group	**Estimate**	**95% CI**	**Sig.**
18-34 (ref) vs. 35-44	0.086	-0.21 – 0.38	0.57
18-34 (ref) vs. 45 and over	-0.36	-0.76 – 0.039	0.077
35-44 (ref) vs. 45 and over	**-0.45**	**-0.81 – -0.078**	**0.018**
Number of Children (ages 4-10)	**Estimate**	**95% CI**	***p* value**
1 child (ref) vs. 2 or more children	-0.13	-0.40 – 0.14	0.34
BMI	**Estimate**	**95% CI**	***p* value**
Underweight (ref) vs. Normal	-0.31	-1.08 – 0.47	0.44
Underweight (ref) vs. Overweight	-0.39	-1.18 – 0.40	0.33
Underweight (ref) vs. Obese	-0.49	-1.30 – 0.32	0.23
Normal (ref) vs. Overweight	-0.087	-0.39 – 0.22	0.58
Normal (ref) vs. Obese	-0.18	-0.55 – 0.18	0.32
Overweight (ref) vs. Obese	-0.097	-0.47 – 0.28	0.61
Education	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	0.17	-0.16 – 0.50	0.31
Low (ref) vs. High	-0.028	-0.39 – 0.34	0.88
Medium (ref) vs. High	-0.20	-0.50 – 0.11	0.21
Income	**Estimate**	**95% CI**	***p* value**
Low (ref) vs. Medium	-0.12	-0.46 – 0.22	0.49
Low (ref) vs. High	-0.25	-0.60 – 0.10	0.17
Medium (ref) vs. High	-0.13	-0.43 – 0.17	0.39
Ethnicity	**Estimate**	**95% CI**	***p* value**
White (ref) vs. Other Ethnicity	0.23	-0.11 – 0.56	0.18
Screen Time and Shopping Habits			
Screen Time	**Estimate**	**95% CI**	***p* value**
None (ref) vs. <1 hour/day	0.58	-1.67 – 2.84	0.61
None (ref) vs. 1-2 hours/day	0.97	-1.26 – 3.19	0.40
None (ref) vs. 3-4 hours/day	1.08	-1.15 – 3.31	0.34
None (ref) vs. 5-6 hours/day	0.95	-1.30 – 3.20	0.41

None (ref) vs. 7+ hours/day	1.29	-0.99 – 3.57	0.27
<1 hour/day (ref) vs. 1-2 hours/day	0.38	-0.075 – 0.84	0.10
<1 hour/day (ref) vs. 3-4 hours/day	0.50	0.025 – 0.97	0.039
<1 hour/day (ref) vs. 5-6 hours/day	0.37	-0.23 – 0.96	0.23
<1 hour/day (ref) vs. 7+ hours/day	**0.71**	**0.035 – 1.38**	**0.039**
1-2 hours/day (ref) vs. 3-4 hours/day	0.12	-0.19 – 0.42	0.45
1-2 hours/day (ref) vs. 5-6 hours/day	-0.014	-0.49 – 0.46	0.95
1-2 hours/day (ref) vs. 7+ hours/day	0.33	-0.24 – 0.90	0.26
3-4 hours/day (ref) vs. 5-6 hours/day	-0.13	-0.60 – 0.34	0.58
3-4 hours/day (ref) vs. 7+ hours/day	0.21	-0.35 – 0.78	0.46
5-6 hours/day (ref) vs. 7+ hours/day	0.34	-0.33 – 1.01	0.32
Shopping Frequency	**Estimate**	**95% CI**	***p* value**
1 time/month or less (ref) vs. 2-3 times/month	-0.50	-1.84 – 0.83	0.46
1 time/month or less (ref) vs. 1 time/week	-0.64	-1.97 – 0.69	0.34
1 time/month or less (ref) vs. >1 time/week	-0.72	-2.05 – 0.61	0.29
2-3 times/month (ref) vs. 1 time/week	-0.14	-0.49 – 0.22	0.45
2-3 times/month (ref) vs. >1 time/week	-0.22	-0.57 – 0.13	0.23
1 time/week (ref) vs. >1 time/week	-0.082	-0.37 – 0.21	0.58
Bring Children to the Store	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	1.97	-0.30 – 4.25	0.089
Never (ref) vs. Sometimes	**2.27**	**0.023 – 4.52**	**0.048**
Never (ref) vs. Usually	**2.28**	**0.029 – 4.54**	**0.047**
Never (ref) vs. Always	**2.32**	**0.053 – 4.58**	**0.045**
Almost never (ref) vs. Sometimes	0.30	-0.22 – 0.82	0.26
Almost never (ref) vs. Usually	0.31	-0.22 – 0.84	0.26
Almost never (ref) vs. Always	0.34	-0.26 – 0.94	0.26
Sometimes (ref) vs. Usually	0.011	-0.28 – 0.30	0.94
Sometimes (ref) vs. Always	0.045	-0.35 – 0.44	0.82
Usually (ref) vs. Always	0.035	-0.37 – 0.44	0.87
Children ask for Food Products	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	-0.038	-2.82 – 2.74	0.98
Never (ref) vs. Sometimes	0.39	-2.37 – 3.14	0.78
Never (ref) vs. Usually	0.47	-2.29 – 3.23	0.74
Never (ref) vs. Always	0.65	-2.11 – 3.41	0.64
Almost never (ref) vs. Sometimes	0.42	-0.13 – 0.98	0.13
Almost never (ref) vs. Usually	0.51	-0.075 – 1.09	0.088
Almost never (ref) vs. Always	**0.69**	**0.086 – 1.29**	**0.025**
Sometimes (ref) vs. Usually	0.085	-0.23 – 0.40	0.60
Sometimes (ref) vs. Always	0.26	-0.088 – 0.61	0.14
Usually (ref) vs. Always	0.18	-0.18 – 0.54	0.33
Buy Food Products for Children	**Estimate**	**95% CI**	***p* value**
Almost never (ref) vs. Sometimes	**0.89**	**0.34 – 1.44**	**0.0016**
Almost never (ref) vs. Usually	**1.31**	**0.69 – 1.94**	**<0.0001**
Almost never (ref) vs. Always	**1.81**	**0.91 – 2.71**	**<0.0001**

Sometimes (ref) vs. Usually	**0.42**	**0.084 – 0.76**	**0.014**
Sometimes (ref) vs. Always	**0.92**	**0.19 – 1.64**	**0.013**
Usually (ref) vs. Always	0.50	-0.24 – 1.23	0.18
Children's Influence on Purchase Decision	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost never	**-1.09**	**-2.03 – -0.15**	**0.023**
Never (ref) vs. Sometimes	-0.73	-1.65 – 0.19	0.12
Never (ref) vs. Usually	-0.56	-1.52 – 0.41	0.26
Never (ref) vs. Always	-0.27	-1.38 – 0.83	0.63
Almost never (ref) vs. Sometimes	0.36	-0.0074 – 0.73	0.055
Almost never (ref) vs. Usually	**0.54**	**0.071 – 1.00**	**0.024**
Almost never (ref) vs. Always	**0.82**	**0.11 – 1.52**	**0.024**
Sometimes (ref) vs. Usually	0.17	-0.17 – 0.52	0.33
Sometimes (ref) vs. Always	0.45	-0.19 – 1.09	0.16
Usually (ref) vs. Always	0.28	-0.37 – 0.93	0.40

Label Use, Nutritional Knowledge and Health Status

Label Use	**Estimate**	**95% CI**	***p* value**
Never (ref) vs. Almost Never	1.24	-0.13 – 2.61	0.075
Never (ref) vs. Sometimes	0.88	-0.53 – 2.30	0.22
Never (ref) vs. Usually	0.68	-0.74 – 2.11	0.35
Never (ref) vs. Always	0.58	-0.86 – 2.02	0.43
Almost Never (ref) vs. Sometimes	-0.36	-0.93 – 0.22	0.22
Almost Never (ref) vs. Usually	-0.56	-1.15 – 0.032	0.064
Almost Never (ref) vs. Always	**-0.66**	**-1.28 – -0.041**	**0.037**
Sometimes (ref) vs. Usually	-0.20	-0.53 – 0.13	0.23
Sometimes (ref) vs. Always	-0.30	-0.69 – 0.078	0.12
Usually (ref) vs. Always	-0.10	-0.44 – 0.23	0.55
Nutrition Information Sought	**Estimate**	**95% CI**	***p* value**
None (ref) vs. Nutrition Claims	**1.65**	**0.71 – 2.59**	**0.0006**
None (ref) vs. Other Nutrition Information	0.69	-0.24 – 1.62	0.15
Nutrition Claims (ref) vs. Other Nutrition Information	**-0.96**	**-1.22 – -0.69**	**<0.0001**
Perceived Nutritional Knowledge	**Estimate**	**95% CI**	***p* value**
Strongly disagree (ref) vs. Disagree somewhat	0.78	-0.26 – 1.83	0.14
Strongly disagree (ref) vs. Neutral/no opinion	0.56	-0.38 – 1.51	0.24
Strongly disagree (ref) vs. Agree somewhat	**0.93**	**0.0012 – 1.86**	**0.050**
Strongly disagree (ref) vs. Strongly agree	0.86	-0.10 – 1.81	0.079
Disagree somewhat (ref) vs. Neutral/no opinion	-0.22	-0.86 – 0.42	0.50
Disagree somewhat (ref) vs. Agree somewhat	0.14	-0.47 – 0.76	0.64
Disagree somewhat (ref) vs. Strongly agree	0.072	-0.61 – 0.75	0.84
Neutral/no opinion (ref) vs. Agree somewhat	0.36	-0.014 – 0.74	0.059
Neutral/no opinion (ref) vs. Strongly agree	0.29	-0.18 – 0.76	0.22
Agree somewhat (ref) vs. Strongly agree	-0.072	-0.42 – 0.28	0.68
General Health	**Estimate**	**95% CI**	***p* value**

Poor (ref) vs. Fair	0.75	-0.34 – 1.85	0.18
Poor (ref) vs. Good	1.01	-0.052 – 2.06	0.062
Poor (ref) vs. Very Good	0.96	-0.12 – 2.04	0.081
Poor (ref) vs. Excellent	0.70	-0.49 – 1.89	0.25
Fair (ref) vs. Good	0.25	-0.19 – 0.70	0.27
Fair (ref) vs. Very Good	0.20	-0.28 – 0.69	0.41
Fair (ref) vs. Excellent	-0.058	-0.76 – 0.65	0.87
Good (ref) vs. Very Good	-0.047	-0.35 – 0.25	0.76
Good (ref) vs. Excellent	-0.31	-0.90 – 0.28	0.30
Very Good (ref) vs. Excellent	-0.26	-0.83 – 0.31	0.37
Medical Conditions	**Estimate**	**95% CI**	***p* value**
No (ref) vs. Yes	-0.012	-0.36 – 0.33	0.94