Thesis

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Master of Science in Economics & Business

(Major in Marketing)

(Un)Healthy Perceptions in the Food Industry

An Empirical Test of the Expensive = Healthy intuition.

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"Anything that slows down the decision-making process is in itself costly... and yet I believe that you can improve decision making if you are conscious of errors"
--- Daniel Kahneman

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Abstract

Consuming a healthy diet throughout life helps to prevent malnutrition in all its forms as well as a range of chronic diseases and conditions. In order to stimulate the consumption of healthy food, it is of great value for marketers and policy makers to understand how consumers evaluate product healthiness. Even though consumers infer product healthiness from multiple intrinsic and extrinsic cues, this study focusses on price as a heuristic cue for the evaluation of food healthiness. Recent research suggests that consumers believe more expensive food is healthier than less expensive food, even in situations where this is not objectively true. This research aims to test for this finding, hence the 'expensive = healthy' intuition. In addition, this study investigates whether a debiasing intervention, aimed at raising awareness on this heuristic, could counteract the 'expensive = healthy' intuition. In order to test for this relationship and the possible effect of a debiasing intervention, a survey experiment is conducted. The analysed data, obtained from 122 respondents, indicate that price has no significant effect on healthiness perception. Furthermore, the results of this study show that the debiasing intervention has no significant moderating effect. These results provide contradictory insights on the effect of food prices on healthiness perception, for which the limitations of the experimental design should be taken into account. This study may help policy makers and marketers to make better informed decisions, without relying naturally on the presence of an expensive = healthy heuristic.

Keywords: price, healthiness perception, quality, heuristics, debiasing, food.

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1. Introduction

In recent decades, the world population has been facing worrying health trends as a result of overweight and obesity. In 2017, The World Health Organization (WHO) announced obesity has nearly tripled since 1975 and the number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014. That same year, 8.5% of adults aged 18 year and older had diabetes. In 2015, diabetes was the direct cause of 1.6 million deaths. Type 2 diabetes accounts for the majority of people with diabetes around the world, and is to large extent the result of excess in body weight and physical inactivity. Eating healthy diets, avoidance of sugar and saturated fats intake are ways to prevent Type 2 diabetes and other diseases, and thus large numbers of deaths in the future. In 2016, more than 1.9 billion adults were overweight, of which over 650 million were obese.

Even though these figures give reason to be pessimistic for the future, consumer food preferences have been shifting towards the consumption of healthier food products, as personal health and wellness continues to increase in importance in recent years. Forbes' article, "Consumers want healthy foods - and will pay more for them" (February 18, 2015) elaborates on this shift in the consumer's mind-set by stating consumers are willing to pay more for products that claim to boost health and weight loss. The article also states that during the 2015 Consumer Analyst Group of New York, many of the major food industry companies focused on the health theme.
More specifically, the report "We are what we eat" published by Nielsen on January 2015 shows that out of 30,000 individuals, considering all demographics, 88% of those polled are willing to pay more for healthier foods.

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As a result of consumers using food choices to manage their health, food companies are putting greater effort on selling products that can be perceived as healthy. In turn, food companies compete more on the healthiness of their products to attract health conscious consumers. Therefore, it is interesting to understand how consumers' purchasing decisions are made for food products and what influences consumers' perception of a product's healthiness. Food companies use different methods to communicate the health benefits consumers experience by the use of their products.

Considerable marketing research has focused on several aspects affecting consumers' perceptions and evaluations towards the healthiness of food. For example, past research examined the effect of packaging colour (Huang & Lu, 2016; Koenigstorfer et al., 2014; Mead & Richerson, 2017), nutrition information (Huang & Lu, 2016; Corish & Moraes, 2015; Kozup et al., 2003) and health claims (Kozup et al., 2003). Whereas prior research has tended to focus mostly on the above-mentioned aspects, this research examines whether product purchasing price has a significant effect on consumers' perception towards the healthiness of food products, as very little research has been conducted on this specific topic. Recent research by Haws et al. (2017), however, suggests that consumers do believe more expensive food is healthier than less expensive food. This research aims to test for these results regarding the effect of food price, functioning as an extrinsic heuristic cue, on consumers' healthiness perception. In addition, this study aims to investigate how to counteract this heuristic, also known as the 'expensive = healthy' intuition.

In order to research the relationship between product price and health perceptions, an extensive review of literature on the price – quality paradigm will be

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done. Previous studies on the price – perceived quality paradigm provide interesting insight on consumer behaviour, especially considering price being one of the most influential extrinsic factors on how consumers evaluate product quality. Even though the price – perceived quality paradigm is often studied, including research focussing on the food industry, the relationship between food product prices and consumers' health perception of the products, has received very little attention to this date. However, in a world where personal and public health is rapidly gaining interest, this is an important issue for future marketers and policy makers in the food industry, as it provides important insights on consumer food decision making. Therefore, it is of great value for marketers and policy makers to know how their pricing strategy and their product pricing affects consumer perception of food healthiness.

Through the use of an experimental study, this research empirically answers the following research questions:

1. *What is the effect of price on healthiness perception for food products?*
2. *Is an informational intervention, aimed at raising consumer awareness for the expensive = healthy intuition, able to 'debias' consumer evaluation?*

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2. Theoretical Framework

In order to find answers to the above-mentioned research questions I propose a theoretical framework that focuses on the extensively researched price – perceived quality heuristic. Reviewing previous literature on this paradigm provides basic principles to examine the price – perceived healthiness relationship. Next, this chapter discusses the concept of perception of healthiness. Finally, debiasing intervention theory is discussed as a possible way to mitigate a possible expensive = healthy heuristic.

2.1. Price – Quality Heuristic

In general, consumers often associate high product price with high levels of quality, and judge lower-priced products to be of lower quality (Shiv et al., 2005; Riesz 1978; McConnel 1968). The question is however, whether such a belief is rational and objectively true, and whether or not consumers are 'tricked' by a common lay belief.

2.1.1. The Origin of the Price-Quality Heuristic

In 1945, Scitovsky stated that the habit of judging quality by price is not necessarily irrational. Namely, "judging quality by price merely implies a belief that price is determined by the competitive interplay of the rational forces of supply and demand". Such a habit of judging could be true and justified when, in a certain market, the majority of buyers can be regarded as experts who have full information on what they buy. In those markets differences in price can be trusted to reflect differences in quality as valued by experts. For marketers, lowering product price is obviously a mean to compete and drive market share. However, changing prices becomes paradoxical when

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price is regarded as an important indicator for quality. In markets where this is the case, pricing becomes an instrument wherewith the seller can affect its consumers' perception of the quality of his products. In other words, a certain product offered at a lower price than competing products, will be more attractive to a consumer on account of its affordability and less attractive on account of its perceived inferior quality (Scitovsky 1945; McConnell 1968). The use of a high pricing strategy to create a high-quality perception among consumers, could thus in reality be a strategy of product differentiation. Riesz (1978) state that "although image differentiation is often thought of in the context of promotion, it is beginning to appear that a high price by itself, or in context with other features, may be a very powerful differentiation variable through its alteration of the product's quality image". The tendency of consumers using price as a quality cue, is even more likely for new products or brands. As a new product has no traditional price, no reputation other than the company's name or brands, its quality is likely to be appraised largely by its price. Given the strategic importance of price and its impact on the quality perceptions of new products, marketers have proposed specific labels to the pricing strategy when entering a new market. In that sense, a new market can be entered using a high price that declines as the product matures, referred to as price skimming, versus entering with a low price in order to gain traction, and subsequently increase the price as the product gains market share, labelled as penetration pricing (McConnell, 1968).

2.1.2. Objective Quality versus Perceived Quality

Quality can be defined as superiority or excellence. However, the exact meaning of food quality depends partly on who is referring to the definition. For example, producers

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commonly give preference to technical use-attributes such as increased yield and suitability for industrial preparation, while the wholesale dealer or retailer relates to visual attributes such as size, form and colour. On the other hand, government policy makers are mainly focused on health aspects such as the used number of contaminants and additives in the food. However, at the end the supply chain, it is the consumer who evaluates the quality of a product and being interested in many aspects, such as taste, freshness, appearance, nutritional value (healthiness) and food safety (Wandel & Bugge, 1996). By extension, perceived quality can be defined as the consumer's judgement about a product's overall excellence or superiority (Zeithaml, 1988). Mitra and Golder (2006) define objective quality as the aggregate performance of all vector product attributes. Hence, those product attributes for which consumers prefer either a high or low level. "For example, a personal computer's objective quality attributes include processing speed, hard disc capacity, reliability, and features like DVD drive and modem" (Mitra & Golder, 2006). In other words, objective quality refers to those features that can be measured and compared. Perceived quality, on the other hand is the overall subjective judgement of quality relative to the expectation of quality. In turn, these expectations are "based on one's own and others experiences, plus various other sources including brand reputation, price and advertising" (Mitra & Golder, 2006).

Clearly, objective quality and perceived quality are not equal. The common lay belief "you get what you pay for" judgement suffers a challenge. Even when the relationship between price and "objective" quality is measured, it seems unadvised to use price a quality cue. Objective quality has been defined as the "unbiased measurement of quality based in the characteristics such as design, durability,

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performance, and safety" (Riesz 1987). Lichtenstein and Burton (1989) concluded that in multiple studies across product categories the overall association between price and objective quality is very low, and in multiple cases even negative. Consequently, they state, "when price-perceived quality and price-objective quality research streams are considered jointly, results suggest that consumers who rely on price to indicate quality may often be misled."

2.1.3. Placebo Effect

Other research, however, goes further by stating that consumers' beliefs and expectations can also affect their subjective experience (Shiv et al. 2005; McClure et al. 2004; Plassmann et al. 2008). One example is the research from McClure et al. (2004), in which the authors find that a coke soda drink may taste better if it has one's favourite brand logo on it, compared to no label. The researchers delivered Coca-Cola ® and Pepsi ® to human subjects in behavioural taste test and also in passive experiments using magnetic reasoning imaging (MRI), in both anonymous delivery and brand-cued delivery of the drinks. For the anonymous task, they found consistent neural responses, whereas in the brand-cued experiment, the researchers found that "brand knowledge for one of the drinks had dramatic influence on expressed behavioural preferences and on the measured brain responses."

Another external cue, namely price, can also alter the efficacy of products to which they are applied. This, so called 'placebo effect', is examined by Shiv et al. (2005). Their research focusses on the question whether marketing actions can, more than just affecting judgements and subjective experiences, influence the actual efficacy of the marketed products. In other words, does price not only affect perceived quality,

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but also actual quality? The results show that consumers who pay a discounted price for a product (e.g., an energy drink thought to increase mental acuity) may derive less actual benefit from consuming the product, than consumers who purchase and consume the exact same product, but at its regular price. In that sense, it could be argued that product price could have an actual effect on a product's quality performance. Another example of this effect is the research from Plassmann et al. (2008). In this research the authors also propose that marketing actions, such as changes in the price of the product, can affect neural representations of experienced pleasantness. Human subjects were scanned by using functional MRI while they tasted wine that, contrary to reality, they believed to be sold at different prices. The results show that "increasing the price of a wine increases the subjective reports of flavour pleasantness". Therefore, this study goes further than only suggesting that perception of quality is positively correlated with price, hence the notion more expensive wine will probably taste better. In addition, the higher taste expectations lead to higher activity in the "medial orbitofrontal cortex", an area in the brain that is widely thought to encode for actual experienced pleasantness (Plassmann et al., 2008).

2.2. Healthiness Perception

2.2.1. A Healthy Diet

One way to maintain or improve one's health is of course a healthy diet in which a consumer makes food choices based on the right set of nutritious food intake. According to the World Health Organization (WHO), consuming a healthy diet throughout life helps to prevent malnutrition in all its forms as well as a range of chronic diseases and conditions. As this could be regarded as common knowledge, an

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increased production of processed foods, rapid urbanization and changing lifestyles, have caused a shift in dietary patters which causes people to not eat enough fruit, vegetables and other dietary fibres such as whole grains.

Then what is a healthy diet? This of course depends on individual characteristics such as age, gender, lifestyle and degree of physical activity. In short, for a healthy diet, the WHO advices the following: 1) consumption of fruit and vegetables (at least 400g), legumes, nuts and whole grains. 2) less than 10% of total energy intake from free sugars (i.e. added sugars and sugars from honey and syrups). 3) less than 30% of total energy intake from fats (unsaturated fats are preferable to saturated fats). 4) less than 5g of salt (WHO, 2018). The importance of a healthy diet is clear, and many people are willing to pay a premium if needed to make healthful food choices. Interestingly, according to research from The Nielsen Company (2018), willingness to pay a premium for health benefits is higher in developing markets than elsewhere. Hence, "more than nine-in-10 respondents in Latin America (92%), Asia-Pacific (94%), and Africa/Middle East (92%) say they are willing to pay more for foods with health attributes to some degree, compared to about eight-to-10 in Europe (79%) and North America (80%).

2.2.2. The Evaluation of Products' Healthiness

As consumers are, in general, obviously concerned with their health and food choices to maintain good health, an important question arises: how do consumers make healthful food choices and what affects one's perception of products' healthiness? Tijssen et al. (2017) state that healthier foods with low salt, fat or sugar content, often lead to lower hedonic evaluation. Furthermore, the authors point out that "healthier foods are less associated with pleasantness and satisfaction, but may be consumed predominantly from

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a more utilitarian point of view (healthier diets, losing weight, managing metabolic disease)".

When evaluating product healthiness, consumers have to draw inferences from extrinsic cues, such as labelling (Mai & Hoffmann, 2015). When inferring healthiness from characteristics of a product, a distinction can be made between intrinsic and extrinsic cues. Intrinsic cues refer to physical properties of the product, whereas extrinsic cues refer to everything else (Grunert, 2005). For food products, intrinsic cues are the ingredients, nutritional content, flavour and texture. Extrinsic cues, hence heuristic cues, are for example brand name, colour or type of packaging, a present health claim and price. As both intrinsic and extrinsic cues are determining food choice, it is important to understand which factors affect consumers' evaluation of food products.

At the point of food choice and purchase intention, extrinsic factors are leading determinants since intrinsic factors have not yet (or at a low extend) been evaluated. In turn, these extrinsic factors cause certain expectations regarding the intrinsic property, hence expectations about the nutritious value (healthiness) of a product (Tijssen et al., 2017). In other words, expectations and perceptions are generally formed based on first impressions, previous experiences and memory. Schifferstein et al. (2013) argue that vision is the most important sense for product evaluation at a buying stage, followed by taste. One of the important cues occurring from vision is **colour**. According to Singh (2006), people make up their minds within 90 seconds of their initial interactions with products and "about 62-90 percent of the assessment is based on colour alone". Signalling healthiness through the use of certain colours is common practice. In the

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Dutch market for example, (alternative) healthy food products are packaged in less vibrantly colours, often a watered-down version of the packaging of a regular (less healthy) version of the product. For example, regular full fat milk is often more dark coloured than semi-skimmed or skimmed milk. In addition, healthier products tend to be coloured in green or blue (cool) coloured packages, whereas less healthy products tend to be packaged in warmer colours like red, purple and black (Huang & Lu, 2015; Tijssen et al., 2017). Product packaging **shape** also serves as a cue to communicate healthiness of food products. Ooijen et al. (2016) argue that the association between body size and healthiness may metaphorically spill over to packaging. The authors found that packaging that simulates slim body shape acts a symbolic cue for product healthiness, as opposed to packaging that stimulates a wide body shape. However, this effect only seems to be present in situations where consumers have a health-orientated shopping goal (Ooijen et al., 2016). In addition, favourable **health claims** positively affect product healthiness perception. Kozup at al. (2003) found that when favourable nutrition information or health claims (e.g. "low in saturated fat and cholesterol") are presented, consumer have lower perceived risks of heart disease and strokes, in addition to a general more favourable attitude towards products and increased purchase intention.

2.2.3. Price as Healthiness Cue

Following the principles of the 'price–quality heuristic' as discussed above, product **price** affects consumers attitude and perceptions towards products. As product healthiness (favourable nutritious content) is closely related to food choice, it could be argued to be closely related to the quality of a certain product. Hence, quality is the aggregate performance of all vector product attributes (Mitra & Golder, 2006). In

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addition, according to Wandel & Bugge (1997), perceived healthiness (of organic food) acts as a parameter for quality for many consumers. Surprisingly little research has examined the relationship between food product price and consumer healthiness perception. However, a research done by Haws et al. (2017) examined an intuition at the crossroads of these two important criteria for food decision making, namely healthiness and price. The authors found that consumers believe that healthier food is more expensive than less healthy food, implying a 'healthy = expensive' intuition.

Several aspects could have led to this lay belief, hence the so called 'healthy = expensive' heuristic. First of all, healthier food patterns are, in general, actually more expensive compared to less healthy food diets. In 2013, Rao et al. (2013) conducted a meta-analysis, focussing on healthier versus less healthy food in relation to price, finding that, on average, healthier food-based diet patterns are more expensive than less healthy patterns. According to the authors, a price difference of $1.50 per day, is the difference in price between consuming a much healthier versus much less healthy overall diet, for example comparing Mediterranean-type diets rich in fruits, vegetables, fish and nuts versus diets rich is processed foods, meats and refined grains. In turn, it may be no surprise that while many unhealthy fast-foods and convenience foods are regarded as inexpensive, healthy food like organic produce are in general regarded as expensive (Hughner et al., 2007).

Even though, in general, healthier foods patterns tend to be more expensive, consumers tend to overgeneralize this belief to situation where this is not objectively true. As consumers are faced with food decision making several times a day, it is too demanding to calculate the true relationship between price and health. As a result,

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consumers are more likely to be engaging in heuristic processing when making food decisions, and therefore possibly rely on the lay belief 'healthy = expensive'. Hence, "this intuition acts as a bias in shaping how consumers process information about health and price when consumers are processing heuristically." (Haws et al., 2017).

Even though the study by Haws et al. (2017) focussed predominantly on the effect of healthiness on price evaluation, the authors also find the 'healthy = expensive' intuition to be bidirectional. In other words, their results also show that when an item is more expensive, consumers infer it to be healthier. Similar, product price as a possible extrinsic healthiness cue and its effect on consumer healthiness perception is the main focus of this study, attempting to test for the effect already demonstrated by Haws et al. (2017). This leads to the following hypothesis:

H1*: Individuals facing higher food prices evaluate the products to be healthier compared to consumers facing lower product prices.*

2.3. Debiasing Intervention

The above mentioned 'price – quality' and 'expensive = healthy' heuristics are the results of how individuals think and process information heuristically, and therefore could possibly act as a bias in the food decision making process. According to Tversky and Kahneman (1974) heuristics are highly economical and usually effective, but they lead to systematic and predictable errors. Before examining ways to counteract these potential errors, it is important to understand why and how biased decision making could occur. According to Kahneman (2011) the mind operates in two underlying, yet interconnected sets of processes, referred to as system 1 and system 2. The first system

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processes fast, automatic, effortless, associative and is slow-learning, hence serving one's intuition. System 2 on the other hand, processes slow, serial, controlled, effortful and flexible and serving, hence enabling someone to reason. In other words, system 1 operates automatically, quickly and with little effort, whereas system 2 allocates attention to the effortful mental activities that demand it and therefore requires concentration. Soll et al. (2015) argue that the source of bias is narrow thinking, stating that the problem for many decisions is that people form judgements based on the limited information that comes to mind or delivered by the environment, which is often incomplete or not objectively true. Therefore, despite its importance, system 1 is prone to a number is systematic biases. In turn, a key function of system 2 is to monitor system 1, identify potentially errors and take corrective action if needed.

For this research, it is important to understand how food choices are made and to what extent these choices are subject to either subconscious or conscious choices. Thijssen et al. (2017) argue that for food choices cognitive effort in decision making is low. These choices are considered low involvement choices and therefore they involve little deliberation. The authors state that involvement level is an important factor in decision making processes, for which holds that the higher the involvement level, the more cognitive thought often goes into making a decision. Soll et al. (2015) propose three ways to reduce the risk of bias, hence debiasing strategies. First, the authors state that system 1 can be trained to generate better intuitions in the first place, hence improving the ability (expertise) to quickly assess situations and generating correct responses. Second, people can be taught cognitive strategies and correct principles (e.g., derived from economics or statistics), such that system 2 is more likely to generate a

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good response. Third, the monitoring of system 1 can be improved, either by sharpening the oversight function of system 2, or through environmental modifications that help provide the oversight. Furthermore, Soll et al. (2015) argue that these debiasing strategies, hence improving the decision making, can be achieved through modifying the person and modifying the environment. This leads to this study's second hypothesis:

H2: *Presenting individuals with an informative message, raising awareness for the healthy = expensive intuition, debiases the intuition that more expensive food is healthier than less expensive food.*

In other words, it could be expected that by educating individuals on the 'healthy = expensive' intuition, people are less likely to evaluate more expensive food products as healthier compared to less expensive food products. By doing so, hence raising awareness and triggering system 2, a potential bias could be counteracted.

2.4. Conceptual Model

The following conceptual model (figure 1) visualizes the proposed hypotheses regarding the food decision making process, for which the effect of price on healthiness perception is examined. Following the theoretical framework discussed above, I expect that individuals facing higher food prices evaluate the products to be healthier compared to consumers facing lower product prices. In addition, I expect that educating individuals through an informative message, acting as a debiasing intervention, counteracts a possible intuition that more expensive food is healthier than less expensive food.

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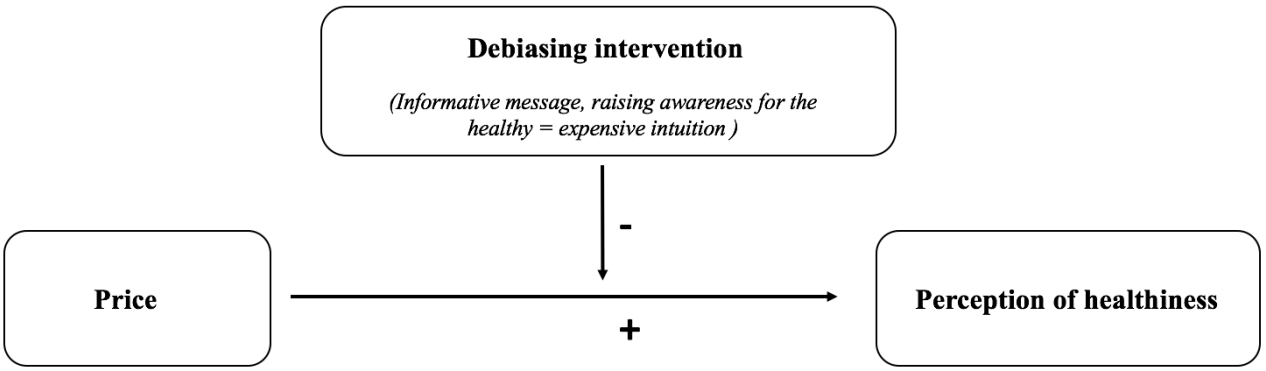
Figure 1.
Conceptual model used in this study



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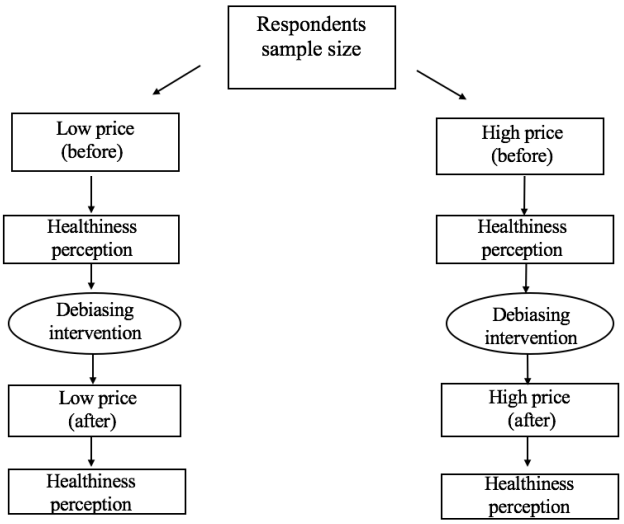
3. Research Methodology

3.1 Overview

The primary purpose of this study is to examine the relationship between food product price and healthiness perception. In order to test for this relationship and a possible effect of a debiasing intervention, acting as a moderator, a survey experiment is conducted. The following experimental design (figure 2) is used to examine the main focus of this research: "What is the effect of price on healthiness perception and does an debiasing intervention counteracts a possible 'expensive = healthy' intuition?". In this design, there is a mix of one between-subjects factor and one within-subjects factor, hence a mixed ANOVA design. Between subjects, the healthiness perception is measured for low pricing versus high pricing. Within subject, the healthiness perception is measured before and after a debiasing intervention.

Figure 2.
Experimental design survey experiment



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3.2 Survey Experiment

A survey experiment was conducted in order to effectively measure the difference in healthiness perception between two groups, either facing low or high food product prices. The structure and overall content of the experimental survey can be found in Appendix A.

First, all respondents were asked whether the Euro is the used currency in one's country, to make sure this prerequisite was met. This requirement was set because the prices in the experiment were displayed in Euro's and respondents had to be well able to differentiate between relatively low versus high prices. Afterwards, demographic information, like age, gender and level of education, was collected.

Subsequently, the respondents were subdivided in two groups, either being exposed to a low-priced product or to a high-priced product. The first product being displayed was either a muesli bar or a fruit juice smoothie, displaying identical information in both groups, except product price being low or high. Pictures of both products were displayed, in addition to the products' ingredients and nutrition elements per serving. Product price for the muesli bar and fruit juice smoothie was manipulated, hence different for both groups, either being low (€ 0,45 and € 0.50 respectively) or high (€ 2.25 and € 2.50 respectively). Hence, the price for high priced products was set five times higher compared to the low-priced products.

After the respondents evaluated the healthiness level of the first product, two quotes from a Washington Post[1] article were shown, acting as a possible debiasing

[1] Respondents were randomly exposed to one of three versions of the article, for which only the name of the source of the study was manipulated, either referring to the Journal of Consumer Research (original source), Journal of Nutrition or a general study (no name). However, the effects of this manipulation were not captured in the output of the Qualtrics software and could therefore not be measured.

intervention. The information in this article informed respondents about the 'healthy = expensive' intuition and its caused bias in the food decision making process. Thereafter, the second product, different from the first, was displayed and again healthiness evaluation was measured. Half of the respondents in each group started with the muesli bar, while the other half was presented with the juice smoothie at first. The order of product display was randomized to minimize the effect of product order on the results of healthiness perception.

After the main part of the survey, respondents were asked to answer some additional questions (five point Likert scales) in order to collect control variables. First, respondents were asked to provide their level of nutrition knowledge, by answering *"regarding food nutrition you consider yourself: (not knowledgeable – very knowledgeable).* This scale is original to Stremersch et al. (2003), however, adapted to nutrition context. Second, the level of health consciousness was collected through the two statements: *"I try to prevent health problems before I feel any symptoms:"* and *"I try to protect myself against health hazards I hear about:" (strongly disagree – strongly agree).* This scale is adapted from the scale original to Moorman (1990) to measure health consciousness. Third, respondents were asked to answer the statement *"I have a lot of confidence in my ability to make healthy food choices:" (strongly disagree – strongly agree),* adapted to the study by Camacho et al. (2014), in order to measure nutrition locus of control. The last control variable, health status, was collected through the statement *"in general, I would say my health is:" (poor – excellent),* also obtained from Camacho et al. (2014),

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3.2 Operationalization of Healthiness Perception

The healthiness perception is measured through four, seven-point Likert scale statements that are used to measure a person's attitude towards the healthiness of a particular product based upon the information provided about it. This scale is derived[2] from the studies by Kozup et al. (2003), measuring nutrition attitude. The scale items are as follows:

1. *I think the nutrition level of this product is (poor / good):*

(Very poor – poor – somewhat poor – neutral – somewhat good – good – very good)

2. *Would this product contribute positively or negatively to a healthy diet?*

(very negatively – negatively – slightly negatively – neutral – slightly positively – positively – very positively)

3. *This product is (bad for your health / good for your health):*

(Very bad – bad – somewhat bad – neutral – somewhat good – good – very good)

4. Overall, how would you rate the level of nutritiousness suggested by the information provided?

(Not at all nutritious – low nutritious – slightly nutritious – neutral – moderately nutritious – very nutritious – extremely nutritious)

[2] The originally used scale (7-point) by Kozup et al. (2003):
1. I think the nutrition level of this product is (poor/good)
2. Bases on the information provided, how important would this product be as part of a healthy diet? (not important at all/very important)
3. This product is (bad for your heart/good for your heart)
4. Overall, how would you rate the level of nutritiousness suggested by the information provided? (not nutritious at all/very nutritious)

3.3 Pre-test

In order to detect potential errors and ambiguities in the survey experiment, a pre-test was performed. A survey draft version was distributed among approximately 10 people, who were asked to complete the survey and provide feedback on certain topics. The results provided valuable insights on multiple aspects, such the clarity, readability, flow and required time span of the survey. Feedback from the pre-test respondents indicated that certain words and sentences had to be reformulated or definitions had to be provided in order to clarify the content of the survey. For example, in order to prevent misinterpretation regarding the meaning of 'nutritious', referring to healthful, a definition[3] of the word nutritious was presented at the start of the survey. In addition, the results indicated that certain visuals had to be altered to ensure good visibility and that completing the survey would take approximately five minutes.

3.4 Data Collection

The questionnaire for the survey experiment was implemented in Qualtrics (https://erasmusuniversity.eu.qualtrics.com). This is a survey software tool in which the survey can be structured and from which the survey data can be imported in SPSS software to analyse results after respondents completed the survey. For a period of seven days the survey hyperlink was put online and potential respondents were kindly asked to fill in the survey and to further distribute the hyperlink within their own network. Multiple social network platforms (e.g. Facebook, LinkedIn and WhatsApp) were used to distribute the request and survey hyperlink. In order to speed up the

[3] Definition nutritious: 'providing nourishment, especially to a high degree, healthful'

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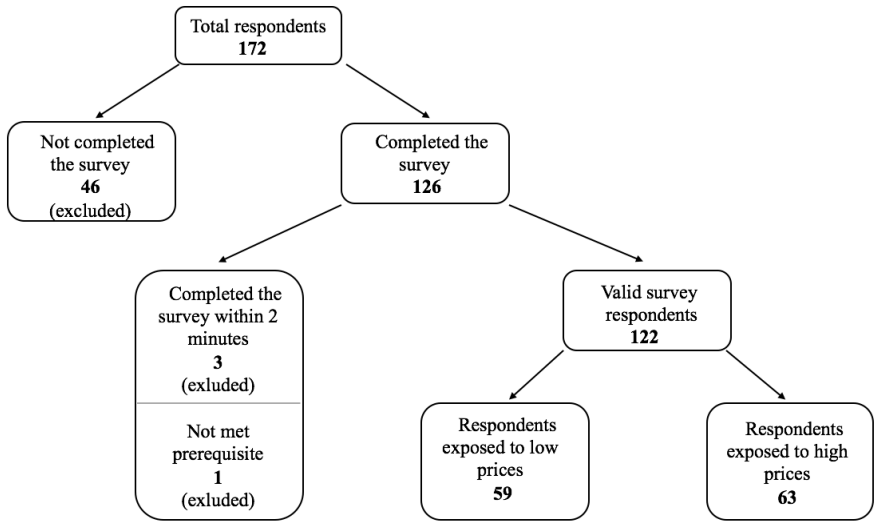
collection process and reward participants for their time and effort, a €50 voucher could be won by completing the survey.

In total, 172 respondents were collected for this study, from which 46 did not completed the survey. Furthermore, 3 respondents were excluded from analysis as they finished the survey within 2 minutes, and 1 respondent did not pass the prerequisite. Therefore, 122 responses could be regarded as the sample, from which 59 respondents were exposed to the low prices products, compared to 63 respondents being exposed to high priced products. The figure below provides a visual overview of the survey data collection.

figure 3.
Overview of the survey response collection



3.5 Manipulation Check

A manipulation check was included in the survey to test whether the manipulation, hence the debiasing intervention, worked and alerted people for the potential bias. To

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ensure that the survey did not take up too much time, a short manipulation check was included at the end of the survey, stating: "I am well informed about how a product's price may bias healthiness perceptions of the product." This item was measured on a 5-point Likert scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree.*

A one sample t-test, with a test value of three, was performed in order to see whether the respondents' level of awareness about the potential bias, was above the neutral level of three. The results indicated that the respondents where above neutrally aware of the potential bias caused by the 'healthy = expensive' intuition ($t = 4.8$, $p < .001$). Respondents demonstrated to be moderately aware of the potential bias, displayed in the Washington Post article ($M = 3.45$, $SD = 1.04$), see Appendix B.

3.6 Cronbach's Alpha

In order to test whether the scale items measuring healthiness perception were sufficiently inter-correlated, the Cronbach's alphas were measured for both situation, hence before and after the debiasing intervention. For both situations, the Cronbach's alphas indicate an excellent internal consistency, hence a high reliability of test scores. The Cronbach's alphas are $\alpha = .928$ and $\alpha = .929$ for the before and after intervention measurements, respectively. These scores are similar to the results from the studies by Kozup et al. (2003), from which this scale was derived (hence $\alpha = .84$ and $\alpha = .85$ for study 1 and 2). The small difference between both scores might be caused by a modest alteration to the second and third statement in the scale. The second statement in the original scale, used by Kozup et al. (2003), reads "based on the information provided, how important would this product be as part of a healthy diet?", ranging from *not important at all* to *very important*. However, the feedback resulting from the pre-test

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indicated confusion on this statement. Therefore, this statement was slightly altered in this study, reading "would this product contribute positively or negatively to a healthy diet?", ranging from *very negatively* to *very positively.* In addition, this modification ensured the scale was more balanced and comparable due to the polar opposites, similar to the three other statements. For the third statement, the original statement "this product is (bad for your heart / good for your heart)' was adjusted to "this product is (bad for your health / good for your health)".

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4. Analysis and Results

4.1. Randomization check

As a result of the experimental design of this study, hence a one between subjects and one within subject design, the sample can be divided in four groups, namely group 1) muesli bar first, low price; 2) muesli bar first, high price; 3) juice smoothie first, low price; 4) juice smoothie first, high price. Even though, the Qualtrics survey software enables automatic randomization in formatting the survey experiment, a randomization check was performed to ensure that the sample is indeed sufficiently randomized. Respectively, the groups sizes are divided as follows: 26.2 %, 25.4 %, 22.1 %, 26.2 %. In order to test whether gender and the level of education (both categorical variables) are evenly divided between the four groups, a Chi-square test has been performed. The results, for both, *gender* (p =.813) and *education* (p = 0.901) indicate no significant difference between the four groups regarding these variables. In respect to the variables age and BMI (continuous variables), two one-way ANOVA's were performed to test for randomization, comparing the average age and BMI between the sample groups. Also, here, the results for both, *age* (p =.877) and *BMI* (p = 0.884) indicate no significant difference between the four groups regarding these two variables. In other words, it can be assumed the randomization has effectively resulted in randomized groups with evenly divided characteristics between the groups of respondents. A more detailed overview of the randomization check can be viewed in Appendix C.

4.2. Description of the Sample and Correlations

The analysed data set contains responses from a net sample of 122 respondents. Regarding gender, the sample is fairly distributed, with slightly more male (51.6 %)

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respondents, as compared to female (48.4 %) respondents. With respect to education, the vast majority (85.2 %) obtained at least a Bachelor degree, indicating that, in general, the sample of this study is well educated. The respondents' age ranges from 18 to 60, with an average of almost 29 years old (M = 28.7) (SD = 10.39). With respect to BMI, respondents tend to have a healthy body weight, hence a general BMI of 22.87. A more detailed view of demographic characteristics is displayed below, in table 1. In addition, two histograms can be found in Appendix D, showing a graphical representation of the respondents' age and BMI.

Table 1
Demographic characteristics

Characteristic	N	**%**	
Gender			
Male	63	51,6	
Female	59	48,4	
Education			
High school	9	7,4	
Some college credit, no degree	9	7,4	
Bachelor degree	55	45,1	
Master degree	48	39,3	
Doctorate	1	0,8	
	N	M	SD
Age	122	28,70	10,39
(min, max)		(18,	60)
BMI (body mass index)	107	22,87	3,17
(min, max)		(17.11,	32.87)

Before the results of the mixed ANOVA's are examined, the correlations between all variables are tested. In table 2, the correlations are displayed, showing either

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a significant or no significant correlation between variables. A number of interesting findings can be obtained from the table below.

Table 2

Pearson's correlations between the variables (N=122)

		1	2	3	4	5	6	7
1. Perceived health t0	Correlation Coefficient							
	Sig. (2-tailed)							
	N							
2 Perceived health t1	Correlation Coefficient	.236**						
	Sig. (2-tailed)	.009						
	N	122						
3. Health conscieusness	Correlation Coefficient	.100	-.042					
	Sig. (2-tailed)	.271	.648					
	N	122	122					
4. Nutrition locus of control	Correlation Coefficient	-.101	.002	.327**				
	Sig. (2-tailed)	.269	.984	.000				
	N	122	122	122				
5. Health status	Correlation Coefficient	.053	-.015	.357**	.425**			
	Sig. (2-tailed)	.559	.872	.000	.000			
	N	122	122	122	122			
6. Nutrition knowledge	Correlation Coefficient	-.216*	-.071	.187*	.419**	.413**		
	Sig. (2-tailed)	.017	.440	.039	.000	.000		
	N	122	122	122	122	122		
7. Age	Correlation Coefficient	-.155	-.131	-.047	.094	.044	.080	
	Sig. (2-tailed)	.088	.149	.610	.301	.631	.379	
	N	122	122	122	122	122	122	
8. BMI	Correlation Coefficient	-0,105	-.042	-.142	-.075	-.156	.001	.219*
	Sig. (2-tailed)	0,283	.668	.144	.442	.109	.996	.023
	N	107	107	107	107	107	107	107

**Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

First, a significant correlation exists (r = .236, p = .009) between health perception before (*perceived health t0*) the debiasing intervention and health perception after (*perceived health t1*) the presentation of the news article. This positive correlation shows that respondents who indicated a high healthiness perception in the first situation, also tend report high healthiness perception after the intervention, and vice versa. Second, this table shows which control variables are relevant in regard to performing the ANOVA, the main analysis of this study. As can been seen in table 2, *nutrition knowledge* (r = -.216, p = .017) is the only control variable which is significantly correlated with health perception. Hence, in order to save degrees of freedom, given the

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limited sample size, nutrition knowledge is the only control variable to be taken into account when performing the ANOVA analyses. In addition, a robustness check is performed with all control variables included, which is further discussed below.

Furthermore, even though not being the main focus of this study, table 2 shows significant and positive correlation for all control variables, in relation to one or multiple other control variables. As can be seen in table 2, BMI is significantly correlated ($r = .219$, $p = .023$) with age. Previous research (Meeuwsen et al., 2010; Mungreiphy et al.,2011; Harmelen et al., 2003) demonstrates the existence of a positive correlation between BMI and age, suggesting BMI tends to increase with age. This finding is important in regard to a potential concern for the truthful response behavior in relation to BMI, as the average BMI of the respondents in the sample is 24.03 and 21.55 for men and women, compared to a population[4] average of 26.1 and 25.3 for men and women, respectively (NCDRisC, 2019). As the sample base is relatively very young, the difference in BMI rates might be explained by the respondents' relatively young age.

[4] The BMI means for men and women in The Netherlands (2016)

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4.3 ANOVA and Hypotheses Testing

In order to measure the mean differences for healthiness perception, a 2x2 mixed ANOVA was conducted, for which the results are presented in table below.

Table 3
Results of the 2x2 mixed ANOVA (N=122)

	Before		After	
Perceived healthiness at	M	SD	M	SD
Low price (N=59)	3.83	1.43	4.13	1.25
High price (N=63)	3.87	1.30	3.77	1.31
Total (N=122)	3.85	1.36	3.94	1.29

	ANOVA		
Dimensions	F (1, 119)	p	η^2
Debiasing intervention	0.85	.358	.007
Price	0.73	.394	.006
Debiasing intervention * Price	1.81	.181	.015
Nutrition knowledge	3.61	.060	.029
Debiasing intervention * Nutrition knowledge	1.37	.244	.011

The results in table 3 show no significant difference in the healthiness evaluation for high prices (M = 3.87, SD = 1.30) as opposed to lower prices (3.83, SD 1.43), in the situation before the debiasing intervention. In other words, the effect of price on healthiness perception is not significant ($F(1,119) = 0.73$, $p = .394$), meaning that price (low versus high) has no significant effect on healthiness perception for the selected food products. Hence, hypothesis 1 is rejected.

In addition, the main effect of the debiasing intervention is not significant ($F(1,119) = 0.85$, $p = .358$), implying there is no significant effect measured for the debiasing intervention. In addition, no significant interaction effect of time and price is found ($F(1,119) = 1.81$, $p = .181$). In other words, the effect of price on healthiness perception is not significantly moderated by the debiasing intervention. Hence, hypothesis 2 is

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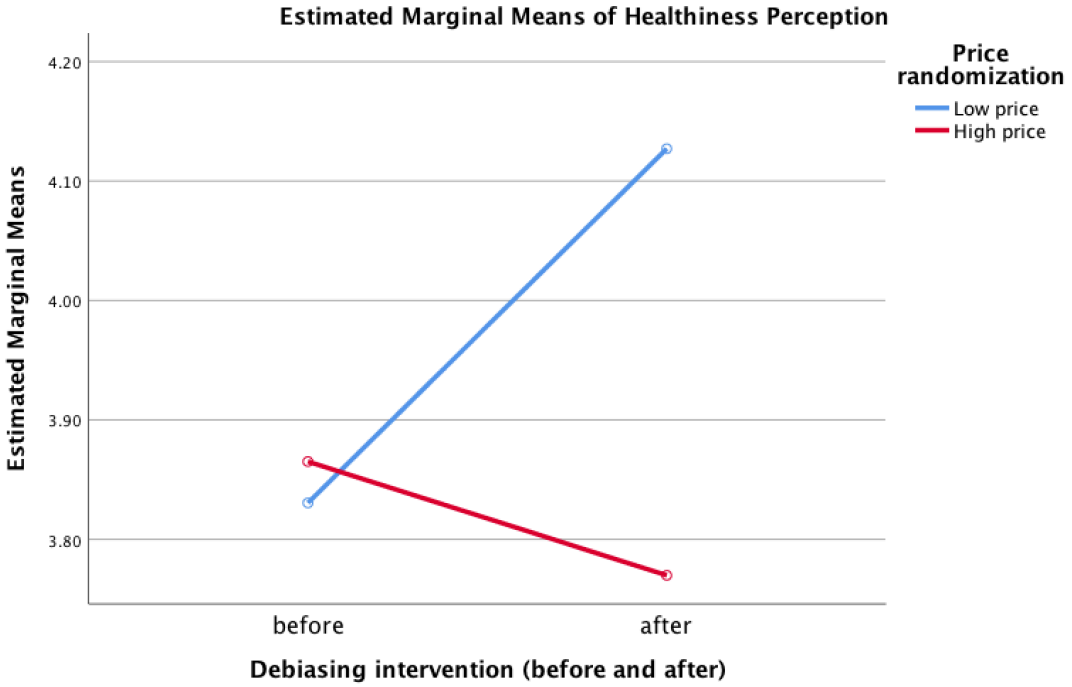
rejected. Figure 4 provides a visual presentation of these outcomes, displaying the measured healthiness perceptions for the low versus high prices groups, before and after the debiasing intervention.

Figure 4
Estimated marginal means for healthiness perception over time



4.4 Robustness Check

In order to test whether the previously estimated effects in the model are sensitive to change, three robustness checks were performed, for which the output results can be found in Appendix E. First, the model was run, excluding six respondents who indicated to be allergic to at least one of the ingredients from the products that were displayed in the survey. The results of this test show no significant effects of the above-mentioned variables price ($F(1,113) = 0.86$, $p = .356$) and debiasing intervention ($F(1,113) = 1.23$, $p = .270$). In addition, no significant interaction effect of debiasing intervention and

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price (F(1,113) = 1.46, p = .229) was found in the first robustness check. However, the control variable nutrition knowledge does have a significant effect in this model (F(1,119) = 4.21, p = .043).

For the second test, the control variables age and BMI were added in the original model, for which the results show no significant effect of price (F(1,102) = 2.45, p = .120) on healthiness perception. Likewise, no significant effect of the debiasing intervention (F(1,102) = 0.17, p = .678) and no significant interaction effect between the debiasing intervention and price (F(1,102) = 1.21, p = .275) was found. In addition, no significant effect was measured for the control variables.

The results of the third test, for which all control variables were included in the model, show similar results. No significant effects for price (F(1,95) = 1.84, p = .178) and the debiasing intervention (F(1,95) = 0.56, p = .455) were found. Furthermore, the result shows no significant interaction effect of the debiasing intervention and price (F(1,95) = 0.814, p = .369) and no significant effect for the control variables. In short, the results from the robustness checks indicate similar results to the original model.

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5. Conclusion

5.1 General Discussion

This research aims to test for replicable results regarding the expensive = healthy intuition, hence examining the effect of food price on consumers' healthiness perception. To the best of my knowledge, this heuristic is only empirically tested in one previous study, by Haws et al. (2017). Although the main focus of that study is related to the effect of healthiness on price evaluation, the authors did also find a bidirectional effect, suggesting a positive effect of food price on healthiness perception. Previous research, although thus being fairly limited, in combination with the 'price – quality' paradigm suggests that consumers fall trap of the 'expensive = healthy' heuristic, thus inferring product's healthiness from product's price. This study tests for the expensive = healthy heuristic, through the use of a survey experiment. Furthermore, this study explores whether a debiasing intervention, hence alerting people on the potential bias in evaluating a product, counteracts such a lay belief.

The results from the survey experiment in this research are in contrast to previous findings by Haws et al. (2017), suggesting consumers do not evaluate food products as being healthier when those are highly priced, compared to low priced food products. Hence, price does not significantly affect consumer healthiness perception. This finding is contradictory to the findings from the study by Haws et al. (2017), which did show evidence for a positive and bidirectional effect of price and healthiness perception for food products. In more general terms, the outcome of this experimental study is also in contrast with other studies suggesting product price affects consumer evaluation for products, hence using price as a heuristic cue to assess products.

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However, it should be noted that these studies do not necessarily examine the single effect of price, and not specifically on healthiness perception, but instead product evaluation in more general terms or for other specific constructs (Shiv et al., 2005; Riesz 1978; McConnel 1968; Plassmann et al., 2008). In addition, it should be noted that the findings of this study are subject to several limitations in the experimental design, which may have caused opposing results. These limitations are further discussed in the section 5.3, below.

As the analyses of this empirical study show, no significant interaction effect exists between price and the debiasing intervention. In other words, alerting people on the potential bias caused by the 'healthy = expensive' intuition, did not significantly affect the effect of price on healthiness perception. This result could of course be partially driven by the fact that no evidence was found for the expensive = healthy bias in this study, in the first place. Even though, this study finds no evidence for the effect of the debiasing intervention, it is premature to conclude that debiasing interventions like this are not effective in situations where consumers are subject to biases. Future research should further examine the potential effect of a debiasing intervention, similar as used in this study.

Furthermore, the control variable *nutrition knowledge* has an significant effect at a 0.10 significance level ($F(1,199) = 3.61$, $p = .06$) on health perception in the situation before the intervention, whereas the p-value increased for the effect of *nutrition knowledge* on healthiness perception ($F(1,199) = 1.37$, $p = .244$) after showing the news article from the Washington Post.

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5.2 Academic Contribution and Managerial Implications

This research contributes to existing literature in the field of food decision making and debiasing intervention. First and more specifically, the findings from this experimental study contribute especially to the field of research regarding heuristics and lay beliefs that affect food decision making. In addition, this research adds new perspectives to the extensively researched price – quality heuristic, as the healthiness of a product could be regarded as being part of a products quality (Mitra & Golder, 2006; Wandel & Bugge 1997). Furthermore, in this study's attempt to validate the results from previous research by Haws et al. (2017) regarding the relationship between price and healthiness perception of food products, the opposing results provide room for future research on the existence and impact of an expensive = healthy heuristic. However, the limitations of this study, as discussed below, may be responsible for the lack of the measured effect of price on healthiness perception.

Next to contributing to existing literature, this research also provides interesting results for policy makers and marketers. As the World Health Organization is constantly exploring regulatory and voluntary instruments (e.g. marketing regulations and nutrition labelling policies), to promote a healthy diet and protect public health, it is of great importance to better understand the potential effect of price on healthiness perception in de food decision making process. The results from this study give reason to be optimistic about the way consumers make judgements about the healthiness of products in respect to prices, as the findings of this study suggest people are not easily tricked by an 'expensive = healthy' lay belief. In other words, this research suggest consumers are not relying on price as a heuristic cue, when evaluation product healthiness, but instead seem to focus on actual nutrition content when processing information to determine

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products' healthiness. For marketers, on the other hand, these results are evenly important as it can be concluded from this research that they should not overestimate the effect price might have on healthiness evaluations, when promoting a product's healthiness is the objective. Rather, marketers should perhaps emphasis more on other product attributes, both intrinsic and extrinsic, such as nutrition content, related health claims, packaging colour and packaging size. However, it is of course not advised to completely disregard price as a cue to communicate certain quality or potential health benefits a product might have, as this research faces several limitations and previous literature does show evidence for the positive effect of price on product evaluation.

5.3. Limitations and Directions for Future Research

As for any research, this study stands only within the boundaries of its limitations, of which multiple are present and provide opportunities for further research. First, the sample base of this study is not an entirely appropriate representation of the population intended to analyse. As 85.2% of the survey experiment respondents is highly educated (at least obtained a bachelor degree) and obtained within a personal network, this study is to some extend subject to a selection bias. It is reasonable to argue that the results of this study are affected by this selection effect. Therefore, it is interesting for future research to examine whether different results are obtained when a better representation of the population is used in examining a similar relationship between price and healthiness perception for food products.

Second, apart from a limited sample size (N=122), only a limited number of products is used in the survey for which respondents had to evaluate its healthiness. Of course, due time and financial restrictions of the experiment, only a limited number of

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products could be used in the process of collecting responses. However, a broader set of product evaluations could provide different insights in regard to product evaluation.

Third, next to price, respondents were exposed to multiple product features, such as a product picture, a nutrition facts table and a set of ingredients (as shown in Appendix A). In a real shopping condition, people are obviously always exposed to the product's (packaging) visuals and price. However, it can be expected that only a small number of consumers takes the time and effort to systematically process all nutritional information which is often displayed at the back of the package in poor readability. Therefore, it is very possible that respondents in this experiment focussed extensively on the nutritional information and therefore processed differently in the experiment than they would in real life. It would be very interesting to see whether different results are obtained when only products' visuals and prices are displayed, which could be examined in future research. On the other hand, future research could also include much more product features, such as colour, shape, size, etc., and conduct a conjoint analysis to better understand the effect of price is in relation to other intrinsic and extrinsic product attributes.

Fourth, although prices were manipulated with a multiple of five, compared to prices shown in the other group, respondents were not asked how they evaluated the displayed prices. Therefore, it is not completely clear whether respondents did in fact evaluate products the be priced relatively low or relatively high. Future research could try to capture the evaluation of price through the use of a manipulation check.

Fifth, future research could further examine the potential debiasing effect of an intervention similar as used in the experiment of this research. As this study finds no significant effect of the debiasing intervention, which could of course be partially driven

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by the fact that no evidence was found for the expensive = healthy bias in the first place, it would be interesting for future research to study the effect of such an intervention in a situation for which an actual bias effect is measured.

In short, this research provides relatively novel, and more specifically, contradictory insights on the effect of food product prices on healthiness perception, for which the limitations of the experimental design should be taken into account. The results of this study may help policy makers and marketers to make better informed decisions, without relying naturally on the presence of an expensive = healthy heuristic.

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7. Appendices

7.1. A) Survey

**this survey example presents a "high price, muesli bar first" (group 2) version.*

Dear participant,

As part of my Master's programme at the Erasmus University, I am carrying out a study concerning food consumption.

Completing this questionnaire will take approximately five minutes. The data will be processed anonymously and will only be used for this research. If you are interested, please fill out your e-mail address at the end of the survey for a chance to win a €50 voucher of your own choice!

I very much appreciate your cooperation. Thank you!

Krijn Hoogesteger

Please indicate whether the Euro is the used currency in your country.

- ○ YES - Please continue with the survey
- ○ NO - You fall outside the target group for this survey. Thank you very much for your willingness to fill in this survey.

In some parts of this survey you will be asked for your opinion about the nutritional value of food products.
For clarity's sake, the definition of 'nutritious' is given below:

"**Nutritious** - providing nourishment, especially to a high degree; nourishing; healthful"

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Please fill in your age

Please identify your gender

- ○ Male
- ○ Female
- ○ Prefer not to say

What is your highest level of education achieved?

- ○ Primary education
- ○ High school degree
- ○ Some college credit, no degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctorate degree
- ○ Other (please specify)

Please take a look at the following product and state your level of agreement with the following statements about this product:

Muesli Bar (68g) 1 bar

€ 2,25

Nutrition Facts

Serving Size	1 Bar (68g)
Servings Per Container	6.0
Amount Per Serving	
Calories	250.0 Cal
Calories From Fat	45.0 Cal
	% Daily Value
Total Fat 5.0g	**8.0%**
Saturated Fat 0.5 g	**3.0**
Trans Fat 0.0 g	
Polyunsaturated Fat 1.5 g	
Monounsaturated Fat 2.5 g	
Cholesterol 0.0 mg	**0.0**
Sodium 180.0 mg	**7.0**
Potassium 220.0 mg	**6.0**
Total Carbohydrate 44.0g	**15.0%**
Dietary Fiber 4.0 g	**16.0**
Insoluble Fiber 3.0 g	
Sugars 22.0 g	
Protein 9.0 g	**18.0**

Ingredients:
Brown Rice Syrup, Organic Rolled Oats, Soy Protein Isolate, Organic Roasted Soybeans, Cane Syrup, Rice Flour, Almonds, Organic Soy Flour, Oat Fiber, Dried Blueberries, Organic High Oleic Sunflower Oil, Organic Invert Sugar Syrup, Apple Juice Concentrate

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I think the nutrition level of this product is:

- ○ very poor
- ○ poor
- ○ somewhat poor
- ○ neutral
- ○ somewhat good
- ○ good
- ○ very good

Would this product contribute positively or negatively to a healthy diet?

- ○ very negatively
- ○ negatively
- ○ slightly negatively
- ○ neutral
- ○ slightly positively
- ○ positively
- ○ very positively

This product is (...) for your health

- ○ very bad
- ○ bad
- ○ somewhat bad
- ○ neutral
- ○ somewhat good
- ○ good
- ○ very good

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Overall, how would you rate the level of nutritiousness suggested by the information provided?

- ○ not at all nutritious
- ○ low nutritious
- ○ slightly nutritious
- ○ neutral
- ○ moderately nutritious
- ○ very nutritious
- ○ extremely nutritious

Please take the time to read the quotes from the following news article:

The Washington Post

Article Title: ***The simple mistake people make when they try to eat healthy.*** **(January 4, 2017)**

Quotes:

"Forget the nutrition facts label, the ingredients list and the say-so of experts: A new study finds that shoppers think a food is healthy only when it costs them more."

"The study, forthcoming in the Journal of Nutrition, is the latest evidence that your brain may work against you when it comes to choosing healthy foods. Researchers say our subconscious association of cost with health — what they call the "healthy = expensive intuition" — can prompt shoppers to not only spend more money but also to make uninformed health decisions without realizing it."

Please take a look at the following product and state your level of agreement with the following statements about this product:

Apple Pineapple Juice Smoothie (235 ml) 1 bottle

€ 2,50

Nutrition Facts

Serving Size	(235 ml)
Servings Per Container	1
Amount Per Serving	
Calories	150.0cal
Calories From Fat	0.0cal
	% Daily Value
Total Fat 0.0g	**0.0%**
Saturated Fat 0.0g	**0.0**
Trans Fat 0.0g	
Cholesterol 0.0 mg	**0.0**
Sodium 15.0mg	**1.0**
Potassium 370.0mg	**11.0**
Total Carbohydrate 36.0g	**12.0%**
Dietary Fiber < 1.0 g	**4.0**
Sugars 32.0g	
Protein 1.0g	

Ingredients:
apple juice from concentrates (water, apple juice concentrate, apple puree concentrate), mango juice from concentrates (water, mango puree concentrate), pineapple juice concentrate, banana puree, kiwi puree

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I think the nutrition level of this product is:

- ○ very poor
- ○ poor
- ○ somewhat poor
- ○ neutral
- ○ somewhat good
- ○ good
- ○ very good

Would this product contribute positively or negatively to a healthy diet?

- ○ very negatively
- ○ negatively
- ○ slightly negatively
- ○ neutral
- ○ slightly positively
- ○ positively
- ○ very positively

This product is (...) for your health

- ○ very bad
- ○ bad
- ○ somewhat bad
- ○ neutral
- ○ somewhat good
- ○ good
- ○ very good

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Overall, how would you rate the level of nutritiousness suggested by the information provided?

- ○ not at all nutritious
- ○ low nutritious
- ○ slightly nutritious
- ○ neutral
- ○ moderately nutritious
- ○ very nutritious
- ○ extremely nutritious

Regarding food nutrition you consider yourself:

- ○ not knowledgeable
- ○ slightly knowledgeable
- ○ moderately knowledgeable
- ○ knowledgeable
- ○ very knowledgeable

I try to prevent health problems before I feel any symptoms.

- ○ strongly disagree
- ○ somewhat disagree
- ○ neither agree nor disagree
- ○ somewhat agree
- ○ strongly agree

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I try to protect myself against health hazards I hear about.

- ○ strongly disagree
- ○ somewhat disagree
- ○ neither agree nor disagree
- ○ somewhat agree
- ○ strongly agree

I have a lot of confidence in my ability to make healthy food choices.

- ○ strongly disagree
- ○ somewhat disagree
- ○ neither agree nor disagree
- ○ somewhat agree
- ○ strongly agree

In general, I would say my health is:

- ○ poor
- ○ fair
- ○ good
- ○ very good
- ○ excellent

I am well informed about how a product's price may bias healthiness perceptions of the product.

- ○ strongly disagree
- ○ somewhat disagree
- ○ neither agree nor disagree
- ○ somewhat agree
- ○ strongly agree

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Please indicate whether you are allergic to any of the ingredients that are part of the products that you have just seen:

- ○ NO - I am not allergic to any of the ingredients that I just saw earlier in this survey
- ○ YES - I am allergic to at least one of the ingredients that I just saw earlier in this survey

How much attention did you pay when reading the Washington Post news article showed close to the start of this survey?

- ○ very low
- ○ low
- ○ neutral
- ○ high
- ○ very high

- Optional -

One of the variables we are interested in as a possible influence on consumers' choice of healthy products is BMI (body mass index), to calculate this we need your height and weight:

Your height (in cm) _____

Your weight (in kg) _____

Earlier you have seen an article from the Washington Post referring to a scientific study published at the Journal of Nutrition. The scientific study is real and was published in a respected journal, the Journal of Consumer Research. However, for experimental purposes I have manipulated the name of the journal in some cases

Thank you very much for filling in this survey!
Please fill in your e-mail address if you want to make a chance to win a €50 voucher.

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7.2. B) Manipulation Check Output

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
I am well informed about how a product's price may bias healthiness perceptions of the product.	122	3.45	1.037	.094

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
I am well informed about how a product's price may bias healthiness perceptions of the product.	4.800	121	.000	.451	.26	.64

7.3. C) Randomization check

Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	bar first, low price	32	26,2	26,2	26,2
	bar first, high price	31	25,4	25,4	51,6
	juice first, low price	27	22,1	22,1	73,8
	juice first, high price	32	26,2	26,2	100,0
	Total	122	100,0	100,0	

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Gender:

Crosstab

			Group				
			bar first, low price	bar first, high price	juice first, low price	juice first, high price	Total
Please identify your gender	Male	Count	16	16	16	15	63
		% within Group	50,0%	51,6%	59,3%	46,9%	51,6%
	Female	Count	16	15	11	17	59
		% within Group	50,0%	48,4%	40,7%	53,1%	48,4%
Total		Count	32	31	27	32	122
		% within Group	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	,953[a]	3	,813	,827		
Likelihood Ratio	,957	3	,812	,827		
Fisher's Exact Test	,985			,827		
Linear-by-Linear Association	,005[b]	1	,941	1,000	,502	,063
N of Valid Cases	122					

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 13,06.

b. The standardized statistic is ,074.

Education:

Crosstab

			Group				
			bar first, low price	bar first, high price	juice first, low price	juice first, high price	Total
What is your highest level of education achieved? - Selected Choice	High school degree	Count	2	2	1	4	9
		% within Group	6,3%	6,5%	3,7%	12,5%	7,4%
	Some college credit, no degree	Count	2	4	2	1	9
		% within Group	6,3%	12,9%	7,4%	3,1%	7,4%
	Bachelor's degree	Count	13	14	12	16	55
		% within Group	40,6%	45,2%	44,4%	50,0%	45,1%
	Master's degree	Count	14	11	12	11	48
		% within Group	43,8%	35,5%	44,4%	34,4%	39,3%
	Doctorate degree	Count	1	0	0	0	1
		% within Group	3,1%	0,0%	0,0%	0,0%	0,8%
Total		Count	32	31	27	32	122
		% within Group	100,0%	100,0%	100,0%	100,0%	100,0%

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Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7,628[a]	12	,813	.[b]		
Likelihood Ratio	7,395	12	,830	,891		
Fisher's Exact Test	7,269			,901		
Linear-by-Linear Association	,686[c]	1	,408	,417	,218	,026
N of Valid Cases	122					

a. 12 cells (60,0%) have expected count less than 5. The minimum expected count is ,22.

b. Cannot be computed because there is insufficient memory.

c. The standardized statistic is -,828.

Age:

Descriptive Statistics

Dependent Variable: Please fill in your age

Group	Mean	Std. Deviation	N
bar first, low price	29,97	12,737	32
bar first, high price	28,10	9,123	31
juice first, low price	28,04	9,452	27
juice first, high price	28,59	10,045	32
Total	28,70	10,386	122

Tests of Between-Subjects Effects

Dependent Variable: Please fill in your age

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	75,017[a]	3	25,006	,227	,877	,006
Intercept	99815,88	1	99815,88	907,672	,000	,885
Group	75,017	3	25,006	,227	,877	,006
Error	12976,36	118	109,969			
Total	113576,0	122				
Corrected Total	13051,38	121				

a. R Squared = ,006 (Adjusted R Squared = -,020)

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BMI:

Descriptive Statistics

Dependent Variable: BMI

Group	Mean	Std. Deviation	N
bar first, low price	22,9821	3,32892	28
bar first, high price	22,6724	1,89669	28
juice first, low price	23,2716	4,22798	23
juice first, high price	22,6344	3,16779	28
Total	22,8723	3,17308	107

Tests of Between-Subjects Effects

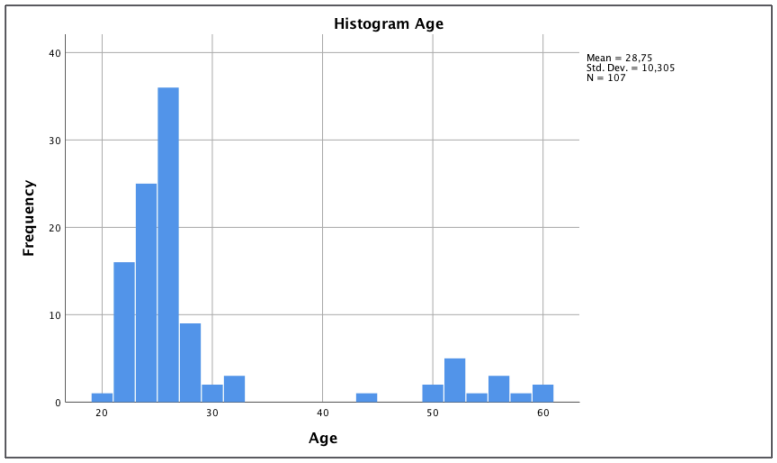
Dependent Variable: BMI

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6,708[a]	3	2,236	,217	,884	,006
Intercept	55658,28	1	55658,28	5405,525	,000	,981
Group	6,708	3	2,236	,217	,884	,006
Error	1060,545	103	10,297			
Total	57043,37	107				
Corrected Total	1067,253	106				

a. R Squared = ,006 (Adjusted R Squared = -,023)

7.4. D) Histograms Age & BMI

Age:



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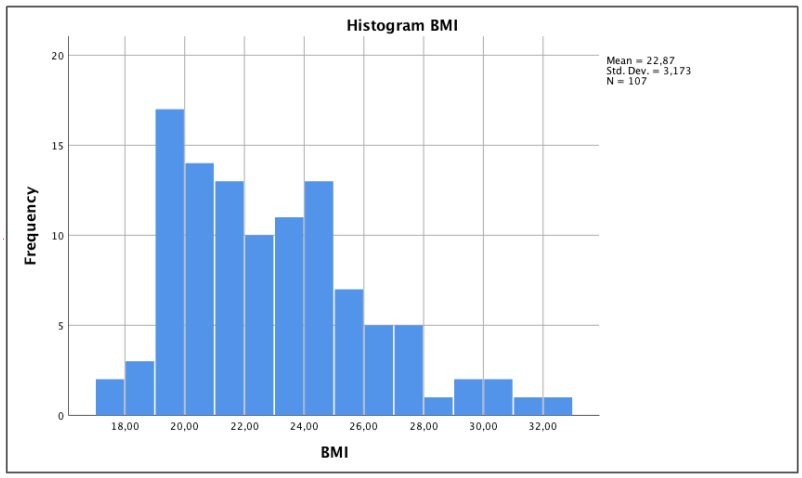
BMI:



7.5. E) Robustness Check Results

Allergic respondents excluded

Tests of Between-Subjects Effects

Measure: Perception_healthiness
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	408.160	1	408.160	185.872	.000	.622
Nutrition_Knowledge	9.241	1	9.241	4.208	.043	.036
Price	1.889	1	1.889	.860	.356	.008
Error	248.138	113	2.196			

Tests of Within-Subjects Contrasts

Measure: Perception_healthiness

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Debiasing intervention	Linear	1.588	1	1.588	1.228	.270	.011
Debiasing intervention * Nutrition_Knowledge	Linear	1.944	1	1.944	1.503	.223	.013
Debiasing intervention * Price	Linear	1.892	1	1.892	1.463	.229	.013
Error(Time)	Linear	146.124	113	1.293			

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Control variables age, BMI and nutrition knowledge included

Tests of Between-Subjects Effects

Measure: Perception_healthiness
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	91,837	1	91,837	45,39	,000	,308
Price	4,966	1	4,966	2,454	,120	,023
Nutrition_Knowledge	1,986	1	1,986	,982	,324	,010
Age	4,006	1	4,006	1,980	,162	,019
BMI	2,898	1	2,898	1,432	,234	,014
Error	206,379	102	2,023			

Tests of Within-Subjects Contrasts

Measure: Perception_healthiness

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Debiasing intervention	Linear	,228	1	,228	,173	,678	,002
Debiasing intervention * Price	Linear	1,587	1	1,587	1,207	,275	,012
Debiasing intervention * Nutrition_Knowledge	Linear	2,002	1	2,002	1,522	,220	,015
Debiasing intervention * Age	Linear	,022	1	,022	,017	,897	,000
Debiasing intervention * BMI	Linear	,007	1	,007	,006	,941	,000
Error(Time)	Linear	134,184	102	1,316			

All control variables icluded

Tests of Between-Subjects Effects

Measure: Perception_healthiness
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	52,919	1	52,919	25,81	,000	,214
Price	3,773	1	3,773	1,840	,178	,019
Education	10,312	4	2,578	1,257	,292	,050
health_con	,026	1	,026	,013	,910	,000
Nutrition_Locus	,097	1	,097	,047	,829	,000
Health_Status	,850	1	,850	,414	,521	,004
Nutrition_Knowledge	2,024	1	2,024	,987	,323	,010
Age	5,725	1	5,725	2,792	,098	,029
BMI	1,982	1	1,982	,966	,328	,010
Error	194,817	95	2,051			

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Tests of Within-Subjects Contrasts

Measure: Perception_healthiness

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Debiasing intervention	Linear	,758	1	,758	,562	,455	,006
Debiasing intervention * Price	Linear	1,098	1	1,098	,814	,369	,008
Debiasing intervention * Education	Linear	1,744	4	,436	,323	,862	,013
Debiasing intervention * health_con	Linear	1,890	1	1,890	1,400	,240	,015
Debiasing intervention * Nutrition_Locus	Linear	,871	1	,871	,646	,424	,007
Debiasing intervention * Health_Status	Linear	1,660	1	1,660	1,230	,270	,013
Debiasing intervention * Nutrition_Knowledge	Linear	2,815	1	2,815	2,085	,152	,021
Debiasing intervention * Age	Linear	,028	1	,028	,021	,886	,000
Debiasing intervention * BMI	Linear	,126	1	,126	,093	,761	,001
Error(Time)	Linear	128,222	95	1,350			

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