The healthier the more expensive?

THE EFFECT OF DISPLAYING A FOOD AS HEALTHY ON THE PERCEIVED EXPENSIVENESS

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PREFACE

This bachelor thesis is part of my study Management and Consumer Studies at Wageningen University. The basis for this bachelor thesis is derived from my interest and passion in consumer behaviour. I am glad that I got the opportunity to write my bachelor thesis by the Marketing and Consumer Behaviour group.

After three months of hard and dedicated working, I can proudly present my bachelor thesis. However, I could not have achieved this without strong support. In special I would like to thank my supervisor, Ellen van Kleef, for her guidance and support throughout my thesis period. Besides, I would like to thank my second reader, Ynte van Dam, for reading and evaluating my bachelor thesis. Also, I would like to thank my dear friend Lotte for her advice and Sander for his support and understanding. Furthermore, I would like to thank all the respondents who were willing to dedicate their time to participate in my experiments.

I hope you enjoy reading.

Femke Rietberg,

Wageningen, April 2019

SUMMARY

The perception that healthier food is more expensive is called the 'healthy-is-expensive' intuition and can be an important barrier for attaining a healthy lifestyle. In this study, it was examined whether Dutch consumers perceive products displayed as healthy to be more expensive. Besides, it was investigated whether a product displayed as healthy was perceived to be of a higher quality. Moreover, it was examined whether there was a correlation between perceived quality and perceived expensiveness of a food products.

In the research, a pre-test was conducted among a small group (n = 17) of respondents to find products with a neutral perception of healthiness. A between-subject experiment (n = 115) was conducted with six different food products. Perceived expensiveness was the key dependent variable and perceived quality was the mediator.

This experiment was based on the study of Haws et al. (2017) in which only one product was used to investigate the 'healthy-is-expensive' intuition. The results of this study showed that a product displayed as healthy was not perceived to be more expensive among Dutch consumers. However, a product displayed as healthy was perceived to be of a higher quality. Regardless of its perceived healthiness, a higher quality was correlated with being more expensive. Since the 'healthy-is-expensive' intuition was only found for one of the six products, the Cream Crackers, the results of this study show that the 'healthy-is-expensive' intuition is product specific.

CONTENT

INTRODUCTION

The number of Dutch inhabitants who are overweight has grown rapidly from one third of the population in the 1980s to around half of the population in 2017 (Centraal Bureau voor de Statistiek, 2018; RIVM, 2018). It is not only a problem for adults, but the percentage of children who are overweight is growing too (Centraal Bureau voor de Statistiek, 2018). In 2017, around one in seven of the Dutch children were overweight (RIVM, 2018). Especially for children, overweight and obesity is a growing concern since it is likely that these children will become overweight adults (Wyatt et al., 2006; Southgate, 1991). Overweight and obesity may create negative consequences for public health (Williams, Mesifor, Winter, Dubbert, & Wyatt, 2015). Examples of food related diseases caused by overweight and obesity are type 2 diabetes mellitus, cardiovascular disease, cancer and hypertension (Guh, Zhang, Bansback, Amarsi, Birmingham, & Anis, 2009).

Therefore, it is important to consume a healthy diet since this may decrease the risk to become overweight and to develop food related diseases (Khodaee, Moghadam, Khademi, & Saeidi, 2015). The Guidelines for a healthy diet were published by the Health Council of the Netherlands (2006) and state that consumers should have a varied diet; daily physical activity; daily consumption of sufficient fruit, vegetables and whole-grain cereal products; eat fish regularly; avoid the consumption of high-saturated fats and of food and drinks that contain a lot of sugar. Moreover, the guidelines stated that the consumption of salt and alcoholic beverages should be limited. Diets rich in vegetables and fruits are widely-known as beneficial for health because of the vitamins, minerals and antioxidants that these foods contain (Slavin & Lloyd, 2012). In general, fruits and vegetables contain low amounts of energy and are good sources of fibre and potassium.

Due to lifestyles changes, urbanization and expanded production of processed foods, dietary patterns have changed (Kodaee et al., 2015). Nowadays people eat insufficient fruits, vegetables and dietary fibres and they increased their consumption of free sugars, fats and high-energy foods. Because of these changes in dietary patterns, many people fail to attain a healthy diet (Kodaee et al., 2015). A commonly used strategy to motivate behaviour change and to motivate people to consume a healthy diet is the use of mass media campaigns (Wakefield, Loken, & Hornik, 2010; Cismaru & Lavack, 2007; Kornfield, Szczypka, Powell, & Emery, 2015). However, despite the implementation of several strategies to prevent people to become overweight, several barriers exist. According to recent studies (Mc Morrow, Ludbrook, Macdiarmid, & Olajide, 2016; Khodaee et al., 2015; Haws, Reczek, & Sample, 2017; Jo & Lusk, 2018) people face several barriers that retain them from following a healthy diet. Examples of barriers are lack of cooking skills, preparation time, willpower, income, food prices, cultural traditions and hedonics; people perceive healthy food as boring or they dislike the taste (Mc Morrow et al., 2016; Khodaee et al., 2015).

Another important barrier is that people perceive healthier food as being more expensive (Haws et al., 2017; Jo & Lusk, 2018) despite evidence that healthy food can be attained with the same budget (Carlson & Frazão, 2012; Huang, Houser, Roberts, & Lichtenstein, 2018). This phenomenon is called the 'healthy-is-expensive' intuition and is driven by so-called 'lay theories' (Haws et al., 2017). Lay theories can be described as the common-sense explanations that people use to understand their social environment (Furnham, 1988).

Research about the 'healthy-is-expensive' intuition was recently conducted in the United States, Korea and China (Haws et al., 2017; Jo & Lusk, 2018). In the study of Haws et al. (2017), it was found that this

intuition causes consumers to make errors when making predictions or decisions regarding healthy food. However, a recent study showed differences between cultures and contexts regarding this 'healthy-is-expensive' intuition (Jo & Lusk, 2018). Because it has only been studied in three countries, there is not an elaborate scientific proof whether the 'healthy-is-expensive intuition exists. Besides, it has not been studied in a European country yet and it is unknown whether this 'healthy-is-expensive' intuition exists by Dutch consumers.

In this study, an experiment will be conducted inspired by the study of Haws et al. (2017) to investigate whether Dutch consumers perceive healthier food to be more expensive. Moreover, in this study it will be investigated whether the 'healthy-is-expensive' relationship is mediated by the perceived quality of the product. In the study of Haws et al. (2017), an experiment was conducted to show the effect of the 'healthy-is-expensive' intuition. In the experiment, participants were asked to rate the perceived healthiness and perceived expensiveness of a granola bar. However, six products instead of one are used in this study to determine whether the effects are robust. Based on the pre-test results, conducted among Dutch participants, six products out of a list of seventeen were selected for this study. It is expected that food displayed as healthy will be perceived to be more expensiveness by Dutch consumers and that this effect will be mediated by the perceived quality.

Therefore, the aim of this research is to examine whether the Dutch consumer relies on the 'healthy-is-expensive' intuition.

The central question is 'What is the effect of displaying a food as healthy on the perceived expensiveness by Dutch consumers?'

Investigating whether the 'healthy-is-expensive' intuition exists in the Netherlands will enlarge existing scientific knowledge and fulfil the knowledge gap that exists. The findings of this study could be beneficial for policy makers to realize what kind of impacts this intuition could have on the choices of consumers and to anticipate on it. Moreover, tools can be developed to steer and guide the behaviour of consumers through campaigns to choose for more healthy nutrition that is affordable for consumers.

THEORETICAL BACKGROUND

IS HEALTHIER FOOD OBJECTIVELY MORE EXPENSIVE?

In recent studies, it has been investigated whether healthy food is more expensive. Some studies indicate that healthier food is indeed more expensive (Rao, Afshin, Singh, & Mozaffarian, 2013; Barosh, Friel, Engelhardt, & Chan, 2014; Jones, Conklin, Suhrcke, & Monsivais, 2014). One study investigated that the prices of food may differ between different neighbourhoods (Barosh et al., 2014). However, the studies show mixed-findings. Other studies stated that healthier food is not always more expensive and that the expensiveness of food may depend on the unit in which it is measured (Carlson & Frazão, 2012; Huang, Houser, Roberts, & Lichtenstein, 2018).

STUDIES SHOWING THAT HEALTHIER FOOD IS MORE EXPENSIVE

In this section studies will be discussed who found out that healthier food is more expensive than less healthier food. Rao, Afshin, Singh and Mozaffarian (2013) analysed the price of healthy diet patterns versus less healthy diet patterns. Data of 27 studies published through December 2011 were used. These studies were conducted in the USA, Canada, Europe, South Africa, Brazil, Japan and New Zealand. The study by Rao et al. (2013) did consider adjustment to inflation and purchasing power parity, because of the different currencies values worldwide. The difference in price for healthy and less healthier food products were quantified for units of price, food groups and diet patterns. The results indicated that the highest price differences were among meats/protein for which healthier food options were 29 dollar cents per serving and 47 dollar cents per 200 calories more expensive. The difference in price per serving for healthy versus less healthier food products were smaller for grains, dairy, snacks/sweets and fats/oils. Overall, the results of this study indicate that healthier diets are more expensive. Healthier diets costs 1.54 dollars more per 2000 kcal and 1.48 dollars more per day compared to less healthier diets. Another study by Barosh, Friel, Engelhardt and Chan (2014) investigated the costs of healthy and sustainable food choices and their affordability for consumers in Greater Western Sydney, Australia. They found out that there are differences in food prices between different neighbourhoods. In this study, different socioeconomic neighbourhoods, food sub-systems and income levels were considered. The results (Barosh et al., 2014) indicate that for all five socioeconomic neighbourhoods, the cost of a healthy and sustainable food basket was more expensive than the costs of a general food basket. Moreover, this study found out that the healthy and sustainable food prices are the highest in the middle-income neighbourhoods and the lowest in more disadvantaged neighbourhoods. Therefore, middle-income neighbourhoods faced the highest inequity regarding the price of healthy and sustainable food. A study by Jones, Conklin, Suhrcke and Monsivais (2014), investigated the change in price of healthy and less healthy foods in the United Kingdom. They found out that in 2012, the mean price per thousand kcal was 2.50 dollars for less healthy items and 7.49 dollars for more healthier food items. Results indicated that the price of healthy items rose faster than less healthy food when measured in absolute terms. Therefore, this study confirms previous research that healthier food is more expensive.

Studies showing that healthier food is not more expensive

However, there are also studies indicating that healthier food is not more expensive.

For example, the study by Carlson and Frazão (2012) stated that healthier food is not always more expensive, but that the expensiveness of healthy food depends on how the price is measured. For example, fruits and vegetables appeared to be more expensive if the food price was measured as a price per calorie. However, healthy foods like vegetables, fruits, grains and dairy foods tended to be less expensive if the price was measured per edible weight.

In a recent study (Huang, Houser, Roberts & Lichtenstein, 2018), the relationship between nutrition quality and entrée costs among casual dining restaurants was investigated. The Estimated Nutrition Score is a metric developed to compare healthy and less healthy entrées and is based on the 2015-2020 Dietary Guidelines for Americans. This study showed that there was no consistent relationship between Estimated Nutrition Score and the price of the entrée at the restaurant. At the restaurants being investigated in this study, the price of healthier entrées was often less expensive or as expensive as the less healthy entrees. Therefore, these studies indicated that healthier food products are not always more expensive.

Consumers' price perception towards healthy food

Although there is some inconsistency whether healthier food is more expensive than less healthy food, consumers often perceive healthier food to be more expensive and consequently, this causes a barrier for attaining a healthy diet.

Healthier food perceived to be more expensive

This section gives an overview of studies indicating that a barrier for healthy eating is caused by the perception that healthier food is more expensive. Nikolaou, Hankey and Lean (2015) found out that budget was a possible barrier for students to attain a healthy lifestyle. Students mentioned that they perceived healthier food to be more expensive than less healthy food. Besides, less healthy food was more often offered at a reduced price. Because of their limited budget, they tended to buy more unhealthy food. This is consistent to a recent study of Love et al. (2018), which showed that poor dietary choices are caused by the perception that healthy food is more expensive. For all the towns in Australia where this study was conducted, the recommended healthy diet was less expensive than the unhealthy diet which was currently consumed. This was also partly caused by restricted geographical access and reduced food securities for these communities. A recent study by Wolfson, Ramsing, Richardson and Palmer (2019) found similar results. For all income levels, consumers perceived the prices of food to be the most frequent barrier to healthy food access.

Hughner, McDonagh, Prothero, Shultz and Stanton (2007), found out consumers perceive organic food to be healthier than conventionally produced food because of the higher price. However, there is no scientific evidence for organic food to be more nutritious (Williams, 2002). This is called the health paradox (Hughner et al., 2007). The price paradox indicates that the higher price of organic food is often seen as a barrier for consumers to purchase organic food. However, if the organic food is offered at a lower price, consumers perceive the food to be of a lower quality and to be less beneficial.

DO CONSUMERS RELY ON THE 'HEALTHY-IS-EXPENSIVE' INTUITION?

Recent studies by Haws et al. (2017) and Jo & Lusk (2018) investigated whether consumers rely on the 'healthy-is-expensive' intuition. These studies will be described in this section.

STUDY HAWS ET AL. (2017)

The study of Haws et al. (2017) found out that consumers make use of the 'healthy-is-expensive' intuition when making decisions. They conducted five studies in which the relationship between price and healthiness is measured.

DESCRIPTION OF THE STUDIES

In the first study (Haws et al., 2017), the influence of the 'health-is-expensive' intuition on consumers' inferences were established. In the four conditions, information about the health grade of the "granola bar" was provided to participants, which was either an A (healthy) or a C (less healthy). Further, it was investigated whether the influence of the 'healthy-is-expensive' intuition operated over and above quality cues by giving participants in two of the four conditions information about the product's quality rated by other people. Subsequently, participants were asked to rate on a seven-points scale both the perceived healthiness of the product and the perceived expensiveness of the product compared to other products. The results indicate that the products provided with a health grade of A were perceived to be significantly healthier than the products provided with a health grade of C. The quality cue used in this study (Haws et al., 2017) did not have any effect. In addition, participants perceived the product described as healthier to be more expensive than the product described as less healthy. The results of this study showed that consumers rely on the 'healthy-is-expensive' intuition when they make inferences of missing attributes. Moreover, the results indicate that differences in the quality perception do not influence the effect.

In the second study the findings from the first study were replicated by using a different procedure and product, a breakfast cracker, and participants had to consume the product. This study investigated whether the 'healthy-is-expensive' intuition was a two-way relation in which provided health information was used to infer expensiveness and whether price was used to infer healthiness. According to the results, the healthier breakfast cracker was perceived to be more expensive. Furthermore, the more expensive cracker was perceived to be healthier. Therefore, the results of this second study indicate that the 'healthy-is-expensive' intuition operates in both directions.

In the subsequent studies, they found out that consumers rely on the intuition in different situations. According to the results, consumers rely on the healthy-is-expensive intuition when both price and health information is present. Besides, a higher standard of evidence exists by consumers for health claims that are inconsistent with the 'healthy-is-expensive' intuition.

SUMMARY OF THE STUDY

In summary, the study of Haws et al. (2017) showed that consumers make use of the 'healthy-is-expensive' intuition is a two-way relationship. Healthier products are perceived to be more expensive and more expensive products are perceived to be healthier. However, this intuition may be applied to contexts in which it is not true. Besides, the healthy-is-expensive intuition may act as a bias in the way consumers process information.

STUDY JO AND LUSK (2018)

In the study of Jo and Lusk (2018) consumers' purchase intentions and change in health, taste and price beliefs towards 60 food items are investigated as a response to exogenously provided health information. This study is conducted in three countries; China, Korea and the USA to determine whether food perceptions differ between cultures. It is investigated whether the lay theories 'healthy-is-expensive' and 'unhealthy-is-tasty' exists by consumers and whether they differ between the different countries. The 'unhealthy-is-tasty' intuition indicates that consumers perceive unhealthy food to be more tasty than healthy food (Raghunathan, Naylor, & Hoyer, 2006).

DESCRIPTION OF THE STUDY

In the study (Jo & Lusk, 2018), participants were asked to rate the perceived health, taste, affordability and purchase intention after images of the 60 food items were shown. Subsequently, participants received information about the healthiness of the food items and repeated the rating. The 60 food items were labelled with health information based on the Nutrition Rich Food (NRF) 6.3 index and energy density. The NRF food score is calculated based on the composition of nutrients. Three clusters were formed based on the NRF, an were labelled as either Green, Yellow or Red. Positive health information was represented by the green signal, neutral health information by the yellow signal, and negative health information by the red signal.

The findings suggest that in the USA and Korea two-way 'healthy-is-expensive' lay beliefs were found when neutral and negative health information was provided. This indicates that when neutral and negative health information was provided, food perceived as healthier was perceived as being more expensive and vice versa. Across countries, the 'healthy-is-tasty' intuition was found when neutral or positive health information was provided. The results of this study showed that tasty foods are considered to be more affordable. Positive health information does not provide signal information about the price. Providing negative health information was found to be the biggest predictor of purchase intention changes. Lastly, the results indicate that purchase intentions are higher for healthier, tastier, and less expensive foods.

SUMMARY OF THE STUDY

To summarize, the study of Jo and Lusk (2018) indicate that there exist differences among cultures with regard to food perceptions. For participants from the USA and Korea a two-way 'healthy-is-expensive' lay theory exists by the provision of neutral or negative health information. Besides the 'healthy-is-tasty' lay theory exists for all countries when positive or neutral health information is provided.

POSSIBLE EXPLANATIONS FOR THE 'HEALTHY-IS-EXPENSIVE' INTUITION

As mentioned before, people tend to perceive healthier food to be more expensive and subsequently perceive more expensive food to be healthier. In the next section, possible explanations for this 'healthy-is-expensive' intuition are described.

HEURISTICS

A possible explanation for the 'healthy-is-expensive' intuition are heuristics. There already exists a lot of evidence that people make use of heuristics when making food decisions (Scheibehenne, Miesler, & Todd, 2007; Schulte-Mecklenbeck, Sohn, De Bellis, Martin, & Hertwig, 2013). When making a decision, people are influenced by certain rules of thumb; they do not examine all attributes but focus on a few pieces of information they find important (Tversky & Kahneman, 1974). People rely on these heuristics, because it reduces the complex tasks of predicting values and assessing probabilities.

According to Rozin (1986), people tend to classify foods as either good or bad for health. The classification of food is unconsciously done by consumers based on the degree of the healthiness of food (Chernev & Gal, 2010). According to Oakes & Slotterback (2001), consumers make use of stereotypes by rating the healthy value of foods. They consider some food as junk, fatty, greasy, or empty calories. The respondents' judgements were balanced by looking on both 'good' aspects (for example minerals and vitamins) and 'bad' aspects (for example fat).

When consumers are unfamiliar with a product, they rely on their 'healthy-is-expensive' intuition and assume the price to be a determinant of the healthiness (Haws et al., 2017). The availability heuristic of Tversky and Kahneman (1973, p. 208) suggest that a person "estimates frequency or probability by the ease with which instances or associations could be brought to mind". This indicates that consumers judge the possible relationship between healthy food and expensiveness based on the ease with which the relevant information can be recalled. If information consistent with this relationship is easily retrieved they assume this relationship to be positive.

LAY THEORIES

Another explanation for the 'healthy-is-expensive' intuition are lay theories. As explained before, lay theories are common-sense explanations people use to understand their social environment (Furnham, 1988). People use their lay theories in everyday life and therefore the way people perceive and respond to their social environment may differ between people. These lay beliefs may bias consumers in processing information about health and price. The 'healthy-is-expensive' intuition may serve as a lay theory for consumers. Because consumers tend to rely on this intuition it may lead to overgeneralization of this intuition to products and contexts where it is not true (Haws et al., 2017*)*. In the case of the 'healthy-is-expensive' intuition, they may perceive a healthier product to be more expensive although this is not always true. Ross and Nisbett (1991) argue that lay theories stem from a combination of self-observation and personal experiences. Morris, Menon and Ames (2001) argue that environmental cues may also contribute to the formation of lay theories. Examples of environmental cues are messages from the media or marketing claims. Media messages who announce that healthy food is more expensive may further influence the 'healthy-is-expensive' intuition of people.

Quality and Price perception

Consumers often perceive an expensive product to be of a higher quality, although this is not always true (Kirchler, Fischer, & Hölzl, 2010). In the study of Kirchler et al. (2010), the correlation between price and quality was investigated. Besides, they studied whether consumers perceive expensive products to be of a higher quality. According to the results, the relation between price and quality exists although it is very small, especially for the food and beverages sector. However, the results of this study indicate that consumers are unable to detect whether the price-quality relation exists in the product category they are examining. Consequently, consumers are more prone to apply the price-quality relation to situations where it is not true which leads to suboptimal decisions. In a recent study (Gneezy, Gneezy, & Lauga, 2014), the price-quality relationship has been studied in three experiments which were conducted at a winery. According to the results of this study (Gneezy et al., 2014), the price-quality relationship is driven by expectations consumers have. A higher-priced product creates higher expectations by consumers. If a product fails to meet the expectations, consumers experience disappointment. This is consistent to a study of Sharma and Garg (2016), who found out that price perceptions are positively influenced by both the perceived quality and perceived value of a product. According to the result, consumers assume they would receive better product features by products with a higher price. The price-quality relationship can be another explanation for the 'healthy-is-expensive' intuition which has also been stated by Haws at al. (2017). Consumers may assume that healthier food is of a higher quality than less healthy food and therefore, may perceive healthier food products to be more expensive.

CONCEPTUAL MODEL AND HYPOTHESIS

Based on the literature research, three hypotheses are formulated. In the theory, it was found that healthier food items are often perceived as more expensive, called the 'healthy-is-expensive' intuition (Haws et al., 2017; Nikolaou et al., 2015; Love et al., 2018; Hughner et al., 2007; Jo & Lusk, 2018). Therefore, it is hypothesized that:

H1: A food product displayed as healthy will be perceived to be more expensive than a food product displayed as less healthy.

In the study of Haws et al. (2017), the 'healthy-is-expensive' intuition was manipulated with a quality cue, however this quality cue had no effect. In this study, it will be examined whether quality mediates the 'healthy-is-expensive' intuition. It is hypothesized that:

H2: A food product displayed as healthy will be perceived to be of a higher quality than a food product displayed as less healthy.

Based on the literature it was found that higher-quality products are often perceived as more expensive (Kirchler, Fischer, & Hölzl, 2010). Therefore, it is hypothesized that:

H3: The higher the perceived quality of a food product, the more expensive a product will be perceived to be.

In figure 1, the three hypotheses are visualized in the conceptual model.

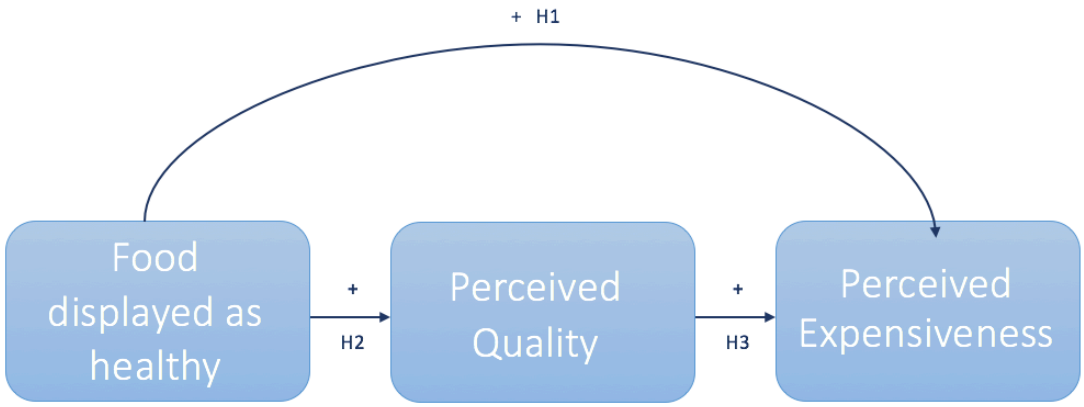

FIGURE 1 CONCEPTUAL MODEL

METHOD

PRE-TEST

To determine which products are suitable to be manipulated as either less or more healthy, a pre-test was conducted among a small group of 17 participants before the main study took place. Participants were recruited for this pre-test via social media like WhatsApp. They were asked to fill in an online questionnaire via Qualtrics which they completed via a smartphone, laptop, computer of tablet. 17 pictures of food products were shown and participants were asked to indicate, on a seven-point Likert scale, whether they agreed with the statement that the product was healthy (1 = strongly disagree, 7 = strongly agree). This statement was shown for all the 17 pictures of food products. After the participant completed the questionnaire, they were thanked for their participation. Participants could give their mail address for debriefing after the study.

17 persons (15 women, 2 men) participated in this study with an average age of 28.35 (SD = 13.61). 15 of the participants were female. Table 1a and 1b show the mean and median scores and the standard deviation for the seventeen products. Six products (Appendix 2) were chosen to implement in the study because the mean scores were at the midpoint level ($3.5 \leq M \leq 4.5$), which indicates that the perception of healthiness for these products was around neutral. The products Robinsons Real Fruit, Gruyère & Spinache Twists, Jacob's Cream Crackers, Hot & Spicy Arrabbiata, Cashew cookie and Oatly! Organic Out Drink were chosen to implement in this study. The standard deviation for these products ($SD \geq 1.4$) indicates that there is a variation in the perceived healthiness.

Table 1a. Mean, Median and Standard Deviation scores for the perceived healthiness of different products

									
Mean	5.1	5.0	4.9	4.7	4.5	4.5	4.4	3.9	3.6
Median	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0
SD	1.0	1.4	1.1	1.4	1.7	1.4	1.7	1.5	1.7

Table 1b. Mean, Median and Standard Deviation scores for the perceived healthiness of different products

								
Mean	3.6	3.5	3.4	3.2	3.1	2.8	2.8	2.1
Median	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
SD	1.7	1.4	1.6	1.2	2.0	1.7	1.6	1.1

DESIGN

The purpose of this study was to investigate whether food displayed as healthy is perceived to be more expensive. Perceived quality is predicted to mediate the effect. In this research, a between-subjects experimental design was conducted in which one factor was manipulated: the positioning of a food as either healthy or less healthy. 115 participants participated in this study on a voluntary basis. Based upon the pre-test, six products (Appendix 2) were used in the main study because they had a neutral perception of healthiness ($3.5 \leq M \leq 4.5$). These products were Robinsons Real Fruit, Gruyère & Spinache Twists, Jacob's Cream Crackers, Hot & Spicy Arrabbiata, Cashew cookie and Oatly! Organic Out Drink. Participants were randomly assigned to one of the two conditions. The first condition is called the healthy condition, the second condition is called the unhealthy condition. The French nutrition labelling called Nutri-score was used in this study to provide the participants with information about the healthiness of the product (Julia & Hercberg, 2017). The Nutri-score consists of five categories ranging from A (green) to E (red). Dependent on the condition the participation was assigned to, the product was manipulated to be either healthy (category A) or unhealthy (category D). At the start of the questionnaire, a short story was given to explain how the Nutri-score could be interpret. Besides, a short sentence was given to explain how the Nutri-score (either an A or a D) could be interpret.

PARTICIPANTS

In this study, 115 participants participated (100 women, 15 men) with an average age of 26.92 (SD = 11.05. Participants did not receive a reward for their participation. Because this study investigated the 'healthy-is-expensive' intuition among Dutch consumers, the questionnaire was in Dutch.

PROCEDURE

Via social media and a mailing list, participants were recruited for this study. Participants completed the questionnaire online via their smartphone, laptop, computer or tablet. They participated on a voluntary basis. At the start, general information was given about the experiment, like the purpose and time span of the experiment. By requesting informed consent from participants, it was emphasized that the information they gave, would be treated confidentially. Besides, a mail address was provided which participants could consult if they had any remarks or questions. Moreover, information was given about the Nutri-score and how they could interpret the Nutri-score. By continuing with the experiment, participants agreed that they were completely informed about the experiment and that their data would be used for the research purposes. First of all, demographic variables were retrieved, like their gender and age. If the participants indicated an age below the 16 years, the questionnaire automatically ended. The participant received a notification that the questionnaire had ended and thanked the participant for his or her participation. If the participant indicated an age above or equal to 16 years, the questionnaire continued and they were randomly assigned to one of the two conditions; the healthy or the unhealthy condition. For all six products, four questions were shown to the respondents. Two questions were about the dependent variable, perceived expensiveness. Participants were asked whether they expected the product to be expensive and affordable. One question was about the mediator, participants were asked to rate the perceived quality of the product. The last question was a manipulation check to determine whether participants perceived the product to be healthy or not healthy. The Nutri-score logo was shown at each product and was either an A or a D. Besides, it was mentioned whether the Nutri-score was an A or a D and

what that meant for the healthiness of the product (the product was either healthy or less healthy. At the end of the survey, participants were thanked for their participation. Participants could give their mail address for debriefing after the study. Besides, they could give their remark or questions in a text box.

MEASURES

DEPENDENT VARIABLE

The perceived expensiveness was our main dependent variable. To determine whether the perceived expensiveness differed between the two conditions, participants were asked to indicate on a 7-point Likert scale whether they agreed with the statement (Haws et al., 2017).

- Compared to other similar products, I would expect this product to be expensive.
- Compared to other similar products, I would expect this product to be affordable.

The statement 'Compared to other similar products, I would expect this product to be affordable' was reversed. For these two items, participants' responses were averaged to create an expensiveness index ($\alpha = 0.78$).

MEDIATOR

As became clear from the literature, quality could mediate the 'healthy-is-expensive' relation (Kirchler, Fischer, & Hölzl, 2010). More expensive products are often perceived to be of a higher quality. Therefore, the perceived quality was retrieved with the following statement to which participants responded on a 7-point Likert scale (Haws et al., 2017; Muskat, Hörtnagl, Prayag, & Wagner, 2019).

- Compared to other similar products, I would expect this product to be of a high quality.

MANIPULATION CHECK

A manipulation check was assessed for the perceived healthiness of food to determine whether the manipulation was successful. Participants were asked to rate on a 7-point Likert scale whether they agreed with the statement (Haws et al., 2017).

- Compared to other similar products, I would expect this product to be healthy.

BACKGROUND CHARACTERISTICS

Besides, participants were asked to give background characteristics, like their gender and age.

- What is your gender?
    - Male
    - Female
    - Neutral
- What is your age?

DATA-ANALYSIS

SPSS Statistics 23. was used to analyse the data. A value of $p < 0.05$ was used for statistical significance.

To determine whether the randomisation was successful, a one-way ANOVA was used to compare the mean age in the two different conditions.

Moreover, a one-way ANOVA was used to compare the means of perceived healthiness of the food products in the two different conditions to determine whether the manipulation was successful. This was done for the overall mean of the food products and for all six food products separately.

HYPOTHESIS 1

To determine whether a healthy product is perceived to be more expensive, a one-way ANOVA was used to compare the means of perceived expensiveness in the two different conditions. This was done for the overall mean of the food products and for all six food products separately.

HYPOTHESIS 2

Besides, a one-way ANOVA was used to compare the means of perceived quality for the two different conditions to determine whether there was a difference in perceived quality if the food was either displayed as healthy or as unhealthy. This was done for the overall mean of the food products and for all six food products separately.

HYPOTHESIS 3

The relationship between perceived quality and perceived expensiveness was analysed by conducting a correlation analysis between the means of perceived quality and perceived expensiveness. This was done for the overall mean of the food products and for all six food products separately.

RESULTS

RANDOMISATION CHECK

First of all, the mean age differed between the two conditions (Table 2). The mean age of the healthy condition was 24.8 (SD = 7.04) and the mean age of the unhealthy condition was 29.2 (SD = 13.91). Separate ANOVA showed significant differences in age between the two conditions ($F(1,113) = 4.622$, $p = 0.03$). The chi-square test for gender showed no significant effect for condition ($\chi^2(1) = 0.009$, $p = 0.923$). So, randomisation was successful for the gender variable and not successful for the age variable. Therefore, age was taken as a covariate in all analyses.

MANIPULATION CHECK

For all six products, the mean score of perceived healthiness was higher in the condition where the food was displayed as healthy (Table 2). The average mean score of all six products was 4.56 (SD = 0.95) in the healthy condition and 3.61 (SD = 1.00) in the unhealthy condition. Several ANOVAs showed significant differences in perceived healthiness for the mean score of the six products between the two conditions ($F(1,112) = 27.292$, $p < 0.001$). This shows that the manipulation was successful.

HYPOTHESIS 1

Subsequent ANOVAs showed barely significant differences in perceived expensiveness between the two conditions (Table 2). Only for the Cream Crackers, the mean score of perceived expensiveness in the healthy condition was significantly higher ($F(1,112) = 6.303$, $p = 0.01$). For the other five products, there was not a significant difference in perceived expensiveness between the two conditions (Table 2). The average mean score of all six products, showed no significant difference in perceived expensiveness for the product displayed as either healthy or unhealthy ($F(1,112) = 1.259$, $p = 0.26$). Therefore, the hypothesis that healthier food products are perceived to be more expensive can only be accepted for one of the six products.

HYPOTHESIS 2

The mean scores of the six products for perceived quality differed significantly from each other in the two conditions (Table 2). For five out of six of the products, the mean score of perceived quality was significantly higher in the healthy condition (Table 2). Only for the Cashew Cookie this difference was not significant ($p = 0.06$). The average mean score of all six products was 4.95 (SD = 0.73) in the healthy condition and 4.22 (SD = 0.95) in the unhealthy condition ($F(1,112) = 20.201$, $p < 0.001$). This indicates that healthier food products are perceived to be of a higher quality. Therefore, hypothesis 2 is confirmed.

HYPOTHESIS 3

There was a positive correlation between perceived quality and perceived expensiveness ($r(115) = 0.424$, $p < 0.001$. This indicates that high-quality products are perceived to be more expensive. Therefore, hypothesis 3 is confirmed.

Table 2. Mean scores (± SD) and P-value for different attributes split by condition

	Displayed as healthy (n = 60)	Displayed as unhealthy (n= 55)	P-value
Randomisation check age	24.83 (± 7.04)	29.20 (± 13.91)	0.03
Healthiness overall	4.56 (± 0.95)	3.61 (± 1.00)	<0.01
Healthiness Fruit Juice	4.45 (± 1.73)	2.89 (± 1.62)	<0.01
Healthiness Twists	4.07 (± 1.64)	3.13 (± 1.52)	<0.01
Healthiness Cream Crackers	4.07 (± 1.46)	3.13 (± 1.23)	<0.01
Healthiness Arrabbiata	4.45 (± 1.44)	3.62 (± 1.42)	<0.01
Healthiness Cashew cookie	4.98 (± 1.36)	4.29 (± 1.51)	0.01
Healthiness Oat drink	5.37 (± 1.13)	4.60 (± 1.56)	<0.01
Expensiveness overall	4.47 (± 0.92)	4.21 (± 0.72)	0.26
Expensiveness Fruit Juice	4.67 (± 1.14)	4.34 (± 1.07)	0.28
Expensiveness Twists	4.82 (± 1.27)	4.51 (± 1.26)	0.53
Expensiveness Cream Crackers	3.33 (± 1.35)	2.76 (± 1.06)	0.01
Expensiveness Arrabbiata	3.83 (± 1.25)	3.48 (± 1.26)	0.15
Expensiveness Cashew cookie	5.19 (± 1.33)	5.12 (± 1.14)	0.69
Expensiveness Oat drink	4.96 (± 1.22)	5.05 (± 1.25)	0.47
Quality overall	4.95 (± 0.73)	4.22 (± 0.95)	<0.01
Quality Fruit Juice	5.03 (± 1.25)	3.65 (± 1.61)	<0.01
Quality Twists	5.16 (± 1.18)	4.53 (± 1.41)	0.03
Quality Cream Crackers	4.42 (± 1.34)	3.64 (± 1.37)	<0.01
Quality Arrabbiata	4.67 (± 1.20)	4.07 (± 1.56)	0.04
Quality Cashew cookie	5.20 (± 1.23)	4.75 (± 1.38)	0.06
Quality Oat drink	5.20 (± 1.01)	4.69 (± 1.39)	0.03

CONCLUSION AND DISCUSSION

This study investigated whether the 'healthy-is-expensive' intuition exists by Dutch consumers. The research question formulated for this study 'What is the effect of displaying a food as healthy on the perceived expensiveness by Dutch consumers?' will be answered in this section.

A product displayed as healthy was not perceived to be more expensive compared to a product displayed as less healthy. However, a product displayed as healthy was perceived to be of a higher quality. Moreover, regardless of its perceived healthiness, a higher quality was correlated with being more expensive.

The results of this study show that the 'healthy-is-expensive' intuition does not exist among Dutch consumers. Although the products displayed as healthy were perceived to be healthy, they were not perceived to be more expensive. It was concluded that only for one of the six products, the product displayed as healthy was perceived to be more expensive. For the other five products, there was not a significant effect. The results are unexpected and differ from the results of Haws et al. (2017) and Jo & Lusk (2018). In the study of Haws et al. (2017), it was concluded that the product, a granola bar, was perceived to be more expensive if it was displayed as healthy.

A possible explanation for the difference in these findings can be that the perceived expensiveness depends on the number of products chosen for this study. In the study of Haws et al. (2017), only one product is chosen to implement in the study, namely a granola bar. In this study, six products were implemented to determine whether the effect is robust. These products were a fruit drink, bread sticks, cream crackers, arrabbiata sauce, cashew cookies and oat milk (Appendix 2). The food products chosen to implement in this study may have influenced the effect. Since Haws et al. (2017) only used one product, the effect of this study is less robust. Besides, the five products with no significant effect could be perceived as being rather cheap by the respondents. Moreover, it could be that people do not have a certain price in their mind regarding these food products.

Although the study of Haws et al. (2017) concluded that the healthy-is-expensive intuition exists, studies without significant results could have been conducted in the past but not published. Successful replications are twice as likely to be published compared to unsuccessful replications (Marín-Franch, 2018). This is called the publication bias and is defined as systematically suppression of findings because of statistical insignificance, small magnitude, or contradiction of prior theory or findings (Begg & Mazumdar, 1994; Dickersin & Min, 1993).

In the study of Haws et al. (2017) health information was provided with a health grade, which was either an A or a C The product was either displayed as being healthy (health grade A) or being unhealthy (health grade C). Furthermore, health information was provided about its health grade. In the present study, the French nutrition labelling called nutri-score has been used to manipulate the product as either healthy (A) or unhealthy (D). Next to the nutri-score, health information was provided about its nutri-score. The difference in use of nutrition labelling between the present study and the study of Haws et al. (2017) may have influenced the results. The study of Jo & Lusk (2018) differed in study design. They did not manipulate the product as either healthy or unhealthy but adapted the health information based on the true healthiness of the product. So, in their study, the products that were indeed healthier were perceived to be more expensive.

Moreover, the findings if this study indicate that food products that were perceived to be of a higher quality were perceived to be more expensive. This is consistent to the hypothesis and previous research that more expensive products are perceived to be of a higher quality (Kirchler, Fischer, & Hölzl, 2010; Sharma and Garg, 2016; Williams, 2002).

THEORETICAL IMPLICATIONS

Previous research has studied the 'healthy-is-expensive' intuition (Haws et al., 2017; Jo & Lusk, 2018) and concluded that the intuition exists. In this study, it was found that the 'healthy-is-expensive' intuition only exists for one of the six products among Dutch consumers. The study design of this study was based on the experiment of Haws et al. (2017) because they also manipulated the healthiness of the food product. In the study of Jo & Lusk (2018), the study design was differed since they did not manipulate the food products as either healthy or unhealthy but determined the choice of the food products based on the (un)healthiness. Therefore, subsequent research could implement a different study design like the study design of Jo & Lusk (2018) by not manipulating a product as either healthy or unhealthy.

PRACTICAL IMPLICATIONS

In the present study, the French nutrition labelling called nutri-score has been used to manipulate the product as either healthy or unhealthy. This nutri-score is a relatively new method and will be implemented in different countries in the future (Julia & Hercberg, 2017; VTM, 2018; Morren, 2019). This study found out that a product with a higher nutri-score (A instead of D) was indeed perceived to be healthier.

LIMITATIONS AND FURTHER RESEARCH

However, the results of this study should be viewed in the light of some limitations. The percentage of women participating in this study was very large (86.9%). Therefore, the results of this study might not be representative for a broader population. In following research, it is important to focus on an equal distribution of gender. Previous research has studied the 'healthy-is-expensive' intuition (Haws et al., 2017; Jo & Lusk, 2018) and concluded that the intuition exists. In this study, it was found that the 'healthy-is-expensive' intuition only exists for one of the six products among Dutch consumers. It is therefore important to investigate the 'healthy-is-expensive' intuition among more different countries and with a wider and more extensive range of products that have a neutral perception of healthiness.

APPENDIX 1 – QUESTIONNAIRE PRE-TEST

Bedankt voor uw deelname aan dit onderzoek. Deze enquête maakt deel uit van mijn onderzoek naar gezonde voeding. De uitkomsten van dit onderzoek zijn essentieel voor het verdere vervolg van mijn afstudeeronderzoek. In deze enquête zal gevraagd worden om uw mening te geven over verschillende voedingsproducten. Hierbij is er geen sprake van goede of foute antwoorden.

Het invullen van deze enquête zal ongeveer 5 minuten in beslag nemen. In dit onderzoek wordt uw anonimiteit gewaarborgd en zal alles naar waarheid worden gerapporteerd. Met het invullen van deze enquête geeft u toestemming om uw antwoorden te gebruiken voor onderzoeksdoeleinden. Het is op ieder moment mogelijk om te stoppen met het invullen van de enquête.

Demografie

Wat is uw geslacht?
Man
Vrouw
Neutraal

Wat is uw leeftijd?
Open

Wat is uw nationaliteit?
Nederlands
Anders

Product gezondheid
Geef voor de volgende producten aan in hoeverre u het eens bent met de stellingen (helemaal mee oneens - helemaal mee eens op een 7-puntsschaal).

Dit product is gezond.

Hartelijk dank voor uw deelname aan het onderzoek. Indien u interesse heeft in informatie over het doel van het onderzoek, kunt u hier uw e-mailadres achterlaten. Wanneer u naar aanleiding van dit onderzoek nog vragen of opmerking heeft, kunt u contact opnemen met femke.rietberg@wur.nl.

APPENDIX 2 – PRODUCTS SELECTED FOR THE STUDY

FIGURE 2 PRODUCTS SELECTED FOR THE STUDY

APPENDIX 3 – QUESTIONNAIRE

Bedankt voor uw deelname aan dit onderzoek. Deze enquête maakt deel uit van mijn onderzoek naar percepties van voeding. De uitkomsten van dit onderzoek zijn essentieel voor mijn afstudeeronderzoek. In deze enquête zal gevraagd worden om uw mening te geven over zes verschillende voedingsproducten. Hierbij gaat het om uw mening en er is daarom geen sprake van goede of foute antwoorden.

Het invullen van deze enquête zal ongeveer 2-3 minuten in beslag nemen. In dit onderzoek wordt uw anonimiteit gewaarborgd en zal alles naar waarheid worden gerapporteerd. Met het invullen van deze enquête geeft u toestemming om uw antwoorden te gebruiken voor onderzoeksdoeleinden. Bij het invullen van deze enquête zijn geen risico's verbonden. Het is op ieder moment mogelijk om te stoppen met het invullen van de enquête.
Bij eventuele vragen of opmerkingen kunt u contact opnemen met femke.rietberg@wur.nl

Bij elk voedingsproduct is een Nutri-score gegeven. Deze Nutri-score is een algemeen aanvaarde voedingsrichtlijn en geeft information over de gezondheid van het product. Het bestaat uit vijf categorieën van A (groen) tot en met E (rood). Producten uit categorie A zijn het meest gezond en producten uit de categorie E zijn het minst gezond.

Door verder te gaan met dit experiment geeft u aan bovenstaande te hebben gelezen en hiermee instemt.

Demografie

Wat is uw geslacht?
Man
Vrouw
Neutraal

Wat is uw leeftijd?
Open

Geef voor de volgende producten aan in hoeverre u het eens bent met de stellingen (helemaal mee oneens - helemaal mee eens op een 7-puntsschaal).

Dit product heeft een Nutri-score A [D] wat betekent dat het product [minder] gezond is. Zie hierboven voor het Nutri-score logo.

Verwachte kostbaarheid
Vergelen met andere soortgelijke producten, verwacht ik dat dit product duur is (Haws et al., 2017).
Vergeleken met andere soortelijke producten, verwacht ik dat dit product betaalbaar is.

Verwachte kwaliteit
Vergeleken met andere soortelijke producten, verwacht ik dat dit product een hoge kwaliteit heeft (Haws et al., 2017; Muskat, Hörtnagl, Prayag, & Wagner, 2019).

Verwachte gezondheid

Vergeleken met andere soortelijke producten, verwacht ik dat dit product gezond is (Haws et al., 2017).

Indien u interesse heeft in informatie over het doel van het onderzoek kunt u hier uw e-mailadres achterlaten.

Wanneer u naar aanleiding van dit onderzoek nog opmerkingen hebt, schrijf ze dan hieronder:

Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij op zoek zijn naar deelnemers. Mogen wij u hiervoor af en toe (maximaal 1 keer per maand) benaderen per e-mail?

Bedankt voor uw bijdrage aan het onderzoek!
Klik op het pijltje naar recht om de vragenlijst in te sturen.

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