The Effect of Visual and Verbal Packaging Elements on Consumers' Healthiness Perception, Understanding, and Trust in a Product

Understanding the effects of visual and verbal package design cues on consumer evaluations and the potential moderating role of cognitive processing style

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Abstract

Obesity, overweight and its health consequences are generally the result of poor eating behaviour. In order to prevent obesity and promoting a healthy diet, consumers should be supported in their aim to make healthier food choices. One strategy to improve consumers' food choices is by enhancing the perceived product healthiness by the use of product imagery and claims on packaging. This in turn might lead to a higher purchase probability and hence consumption. Accordingly, the aim of this study was to gain insight into the effect of visual and verbal elements in product packaging on consumers' understanding, and appraisal of healthiness and credibility of a product by taking into account the possible moderating role of consumers' thinking style. A two (image: healthy, less healthy) by three (claim length: short claim, medium claim, longer claim) experimental design was set up in the form of an online questionnaire. In total, 162 consumers rated product labels in terms of the product's perceived healthiness, the credibility and understanding of the conveyed health benefits and completed a questionnaire about their thinking style (experiential and rational). Results indicated that regardless of an individual's thinking style, the perceived product healthiness improved when as less caloric image was shown. At the same time refraining from a nutrition claim towards a health claim that conveys the ingredient, its function and the health outcome led to a better understanding of the products' health benefits and improved the perceived healthiness. However, the level of influence of the verbal stimuli on consumers' healthiness perception is depended on an individual's thinking style, whereby these stimuli appeared to be significant for consumers that are high in their need for cognition and marginal for consumers that are low in their need for cognition. The findings of this study gave more insight in the effectiveness of the usage of both visual and verbal packaging elements which might contribute towards reducing obesity and its negative health consequences.

Key words: verbal packaging elements, visual packaging elements, rational cognitive style, experiential/intuitive cognitive style, healthiness perception, understanding, credibility

Preface

Dear reader,

At this moment you are starting to read the project that I have been working on over the last months: my Master thesis. During my Master program 'Management, Economics and Consumers studies' at the Wageningen University I became interested in the combination of marketing, health and consumer psychology. As a result, this has led to the topic of this thesis; namely the understanding and usage of packaging cues in order to promote more wholesome food choices while taking into account consumers' different cognitive styles.

Although the process of doing research, writing, discussing, analysing, rewriting, and finalizing this project was not always easy, I am proud to present you the final version of this paper. Finishing this study has been one of the last stages of and got me one step closer to my graduation. However, I would never have been able to hand it in without the help of some people. Therefore, I would like to take this opportunity to be grateful to everyone that helped me throughout this process. I would not have come this far without those people.

Foremost, I would like to thank my supervisor Betina Piqueras-Fiszman for her help and support throughout this study. She gave me a lot of freedom during the formation of my thesis and the writing process. Nevertheless, she was still involved and always available for questions, clarifications and advice. Moreover, I would like to thank Ellen van Kleef for helping me with the translation and distribution of my questionnaire. Since there were difficulties in recruiting respondents that met the selection criteria, without her, the recruitment process would probably have taken twice as long. In this end I would like to thank my beloved family and friends for their endless support, inspiring pep talks and ideas and helping me with distributing my questionnaire.

Since the topic of my study always kept me interested and motivated, it was a delight to work on this project. I hope you will read this study with pleasure.

Maureen Overduin – Utrecht, February 2016

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1. Introduction

In 2012, around 50 % of the Dutch population were overweight (Planbureau voor de Leefomgeving, 2014). The expectation is that over the years this number will continue to grow. Among these overweight people, around 11% of men has severe overweight (obesity), whereas this percentage is 14 amongst women. Obesity might cause various negative health consequences that affect both physical and mental health (Van Kreijl & Knaap, 2004; World Health Organization, 2000). Of these physical consequences diseases such as cancer, diabetes type 2 and cardiovascular diseases might occur (Hassler, 2002). Overweight is caused by poor eating behaviours, whereby the calorie intake exceeds the energy expenditure of the body. Moreover, a poor diet is often also associated with consuming inadequate amounts of healthful nutrition such as fruits, vegetables and fish which account for an individual's cardiovascular health (Van Kreijl & Knaap, 2004; Planbureau voor de Leefomgeving, 2014).

One strategy to reduce and/or prevent obesity and obtain overall wellbeing is to promote a healthy lifestyle and dietary pattern. The role of the government, media and food industry can be crucial towards altering consumers' diets (World Health Organization, 2000). For example, the government could take the responsibility to educate and inform consumers about the benefits of healthful and varied nutrition on their wellbeing, whereas the food industry can take, for instance, responsibility for promoting hearty foods. Today, even consumers are becoming more aware of the contribution of a wholesome diet to their overall health and wellbeing (Bigliardi & Galati, 2013; Hernández-Carrión, Varela, Hernando, Fiszman & Quiles, 2014; Lähteenmäki, 2013; Patch, Tapsell, & Williams, 2005). Their concern towards a healthy lifestyle has resulted in an increased request for healthful nutrition. This, in turn, has led to the introduction of food products with specific nutrition- and health-related claims that assist consumers towards making better-informed and healthier choices (Lähteenmäki et al., 2010; Nocella & Kennedy, 2012; Van Trijp & Van der Lans, 2007; Williams, 2005). These food products are so-called functional foods. Although there is no single definition of the term 'functional foods', they are often described as food products that have beneficial health-effects besides the basic nutritional value of the product. This might lead to an improved and optimized well-being and/or reduces the risk of a disease (Hassler, 2002; Krystallis & Chrysochou, 2012; Patch et al., 2005; Van der Zanden, van Kleef, de Wijk, & van Trijp, 2014).

Within-store, food choice is highly affected by the product packaging (Silayoi & Speece, 2004). Since over 70 % of all purchase decisions are made in-store, the package design of a product is fundamental in encouraging consumers towards the purchase of enriched foods (Clement, 2007). Besides protecting the product during the distribution process, the package is also an excellent communication tool (Creusen & Schoormans, 2005; Schoormans & Robben, 1997). One of the main roles of packaging is to draw consumers' attention and communicate the products' attributes (Silayoi & Speece, 2007). According to Solayoi & Speece (2007), the packaging elements can be divided into visual- and verbal (informational) packaging elements. Visual stimuli primarily generates consumers' attention by causing the product to stand out in the competitive crowd, serving as a cue for comparing products and to evoke expectations of the sensory product aspects (Underwood, Klein & Burke, 2001). Verbal stimuli can more directly communicate the products' benefits which might lead to an increased interest and intention of wholesome food consumption (Carillo, Varela & Fiszman, 2012; Grunert, 2002). So in order to stimulate a healthy dietary pattern and increase the perceived healthiness of a product, the general aim of this study is to obtain a better understanding how visual and verbal stimuli affect consumers perceptions. Therefore, this paper will specifically constrain its focus on the use of varying pictures (visual stimuli) and the informational amount of varying claims (verbal stimuli).

Since the supply of functional foods is growing with claims that vary in length and extensiveness, it is not clear yet which claim length can be used best in order to stimulate a healthy dietary pattern. In addition, the effect of the informational amount of claims on consumers' understanding has not been researched extensively and is lacking an unequivocal answer. Furthermore, it is interesting to examine whether there is an interaction between verbal and visual stimuli. E.g. a longer claim might lead to a better understanding of the conveyed health benefits, which in combination with pictorial elements might increase the perceived healthiness dramatically. Moreover, it is of importance to study the effect of verbal and visual stimuli on the credibility of the product, since a decreased credibility might lead to a lower intention to buy the product. Thus, the dependent variables that are of interest in this study are healthiness perception, understanding and credibility.

With respect to the informational processing of stimuli, consumers can be split up into categories: some consumers rely more on the visual aspect of a product while others rely more on the verbal aspect on the product (Shiloh, Salton & Sharabi, 2002). Variances in consumer evaluations and food choice might thus be the cause of an individuals' cognitive processing style. Hence, a few studies are that cognitive processing style moderates how consumers evaluate a product. However, insufficient literature has been conducted towards the effect of an individual's cognitive thinking style on the evaluation of food choice and the product information. Therefore, it is important to gain more knowledge in this field (Mawad, Trías, Giménez, Maiche & Ares, 2015).

Consequently, the central research question of this paper is:

'What is the effect of the amount of information in a claim and the use of different food pictures on consumers' healthiness perception, understanding, and trust in a product that is originally categorised as unhealthy and is this effect potentially moderated by an individuals' cognitive thinking style?'

In order to answer this question, the following sub-questions are established for the dependent variables (healthiness perception, credibility, and understanding):

> *SQ1: What is the combined and separate effect of food pictures (healthy vs. unhealthier) and the amount of information in a claim on consumers' healthiness perception of a product and understanding of the conveyed health benefits?*
> *SQ2: In what way do food pictures (healthy vs. unhealthier) in combination with the amount of information in a claim affect the credibility of a product?*
> *SQ3: In what way does cognitive processing style interact with the relationship of the informational amount of claims, the use of different food pictures and the combination between these visual and verbal stimuli on a products' perceived healthiness?*

Information about the separate and combined effect of visual and verbal stimuli on consumer perceptions of the wholesomeness of a product and whether this relation might possible be affected by consumers' cognitive thinking style is essential to gain more insight in the establishment of the food choice process. Gaining more insight into this field might be valuable with regard to encouraging consumers towards healthier food choice decisions by understanding in what way the verbal and visual transmission of the products' health benefits can be optimized.

This paper will be structured the following: in Chapter 2 prior research aligned with the purpose of this study will be outlined. Firstly, the process of how food choices are established will be discussed. Thereafter, a theoretical framework will draw the importance of packaging cues and outlines the effect of pictorial elements and varying claims on consumer evaluations by exploring existing literature.

Furthermore, an overview will be drawn about the influence of cognitive thinking style on information processing. For both the main effects and the moderator, hypotheses will be established. Chapter 3 includes the empirical part of this study in which an experiment was conducted whereby the package design of a existing functional product was manipulated. These varying packages were shown to the participants in an online survey. By modifying the package design variances in consumer evaluations were measured. The results of this experiment will be given in Chapter 4. Chapter 5 will discuss the results as well as the study limitations and will give recommendations regarding future studies. Moreover, in this chapter an overall conclusion will be drawn.

2. Theoretical framework

2.1. Food choice process

Per day, consumers have to make numerous choices (Sobal & Bisogni, 2009). The choices that consumers make with regard to their nutritional intake are decisive for their overall well-being and health. In order to guide consumers towards a wholesome diet, the food choice process should be understood (Steptoe, Pollard & Wardle, 1995). The food choice process, however, is a very complex and dynamic process that includes numerous (interacting) factors and is not easy to understand (Bisogni, 2009; Furst, Connors, Bisogni, Sobal & Falk, 1996; Köster, 2009; Shepherd, 1999; Sobal & Labrecque et al., 2006). The process involves several decisions on various levels, such as what to eat and when (Sobal & Bisogni, 2009). Even within these levels, the choice can be either simple or complex when the choice involves many options.

The process of food choice has been studied widely within several disciplines. Multiple authors have attempted to integrate the process of food choice into a multidimensional model. One of the most recognized models is shown in Figure 1 (Furst et al., 1996, p. 251). The authors conceptualized a funnel-shaped model in order to describe the food choice process and the factors influencing this process. The model consists of three major components: life course, influences and personal system.

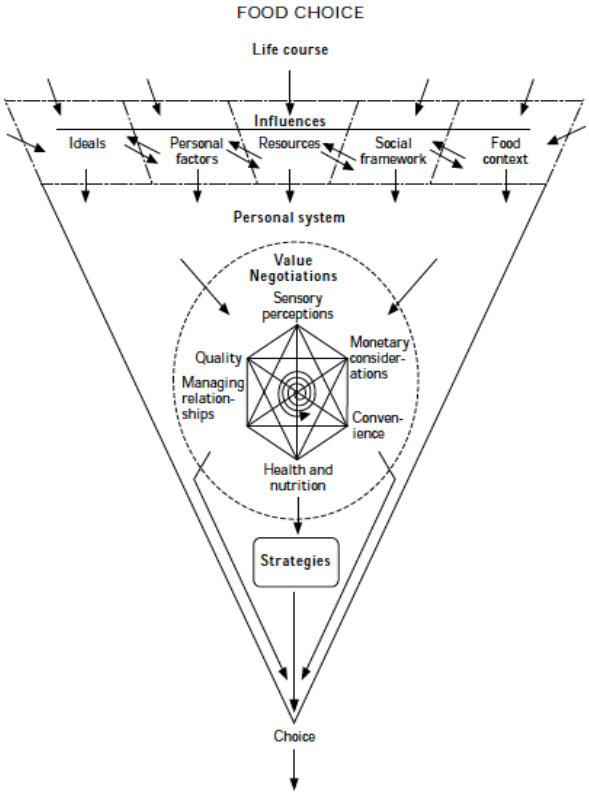

Figure 1: A conceptual model of the food choice process components

The first component is the life course, which is the broad base formed throughout a person's life. This component is based on past, current, and future experiences and practices. As a consequent, the life course is changing over time. The second component, influences, are shaped by an individual's life course and can be divided into five influences: personal factors, social framework, resources, food context and ideals. The impact of those influences depend on the food choice situation. The third component consists of value negotiations and strategies. Within those value negotiations, six (main) factors consist: sensory perceptions, managing relationships, monetary considerations, health/nutrition, convenience, and quality. These values are deliberately weighed on the perceived benefits versus risks on each of these values. According to Furst et al. (1996) the process of value negotiation is an essential part within the food choice process. So, when aiming to promote healthy food consumption, it is important to combine these factors into a multifaceted approach (Steptoe et al., 1995). Some values might act as a constraint: e.g. a person who suffers from obesity might value health different than a person with a normal weight. However, these constraints are dependent on the individual.

The value negotiation process is a very dynamic and context dependent process that differs per situation, per person and is changeable over time (Sobal & Bisogni, 2009). Since consumers have to make several food choice decisions each day, they often make use of strategies to simplify their choices. These strategies developed over time into heuristics. A heuristic can be described as an approach that simplifies the decision making process in terms of effort and time (Gigerenzer & Gaissmaier, 2011). One aspect of heuristics is that consumers ignore fragments of information and rely on rules of thumb instead. When the decision making process is based on heuristics the food choice decision might become automatic and routine-based (Furst et al., 1996). So, on one hand there is the process of deliberate value negotiation, whereas on the other hand food choice might be an automatic process. Whether an individual relies on one or the other process is also affected by the situation and the context.

2.1.1.The role of functional foods and its packaging in the food choice process

Since it is very complex to change automatic behaviour, the focus of this paper will be mainly on the value negotiation process and the communicative transmission of these values. In a study conducted to assess the underlying motives that determine food choice, Steptoe et al. (1995) found in their study that sensory appeal, health, convenience and price are the most significant factors influencing food choice. These factors largely overlap with the values described by Furst et al. (1996). The elements that define sensory appeal are taste, appearance, odour and texture. Glanz, Basil, Maibach, Goldberg & Snyder (1996), argued that taste is a boundary condition for consuming foods. Moreover, health is also acknowledged to be substantial in the food choice process. This factor has been recognized in fifteen European countries to be one of the most influential factors regarding food selection (Brunsø, Fjord & Grunert, 2002). Since a substantial part of the products that are found in supermarkets are packaged, product packaging plays a significant role with regard to the conscious and subconscious transmission of these food choice motives. The communicative role of packaging will be discussed below.

One way to enlarge overall health and well-being and to increase the intake of healthful food is to promote the consumption of functional foods. As mentioned in the introduction, functional foods are food products that may have beneficial health effects beyond their basic nutritional value (Bech-Larsen & Grunert, 2003). So, functional foods claim to be healthier than their regular product varieties that are not enriched with a specific nutrient. In order to ingest these additional nutrients that might lead to advantageous health effects, consumers do not have to change their diets. This contributes to the concept of convenience, which can be communicated to consumers the use of packaging cues.

Functional foods possess the property to have health-beneficial side effects. However, the wholesomeness of a product is a credence attribute that most consumers cannot assess themselves (in the short-run) by consuming the product (Brunsø et al., 2002; Grunert, 2002). Therefore, packaging also plays a significant role in the food choice process by being able to incorporate and convey these additional values and product attributes. For example, the package of a product can function as communication tool by conveying these health effects.

In addition, for most products including functional foods, sensory attributes cannot be assessed prior to consumption and thus sensory expectations are inferred by evaluating the packaging of the product (Underwood et al., 2001). Moreover, the expected quality of a product is often also perceived by evaluating the product packaging (Brunsø et al., 2002). E.g. the appearance of a product and the used packaging material might infer that the product is of a certain quality.

It can thus be concluded that the packaging of a product is an important communication tool which able combine and incorporate several food choice motives. This draws the significance of proper product packaging. Therefore, the role of packaging will be further illustrated in the following paragraph.

2.2. Packaging

Over the years, the significant influence of packaging on purchase decisions has been acknowledged since approximately 73 % of consumers make their decision at the point of sale (Rettie & Brewer, 2000). Prior to the final purchase decision, packaging is often the last impression consumers obtain from the product (Nawaz, Billoo & Lakhan, 2012). In addition, about 50 % of all purchases are unintended, which highlights the importance of appropriate product packaging on the shelves (Nancarrow, Tiu Wright & Brace, 1998). Besides representing and supporting the values of the brand, making the product stand out in the competitive crowd and protecting and facilitating the product during distribution, the package design entails more advantages (Nawaz et al., 2012; Schoormans & Robben, 1997). Firstly, the package might draw attention (Ares, Piqueras-Fiszman, Varela, Marco, López & Fiszman, 2011 Creusen & Schoormans, 2005). Second, when consumers' attention has been drawn to the product, the package is able to convey the products' attributes and values, reinforce the perception of the product, and generate hedonic and sensory expectations, quality judgements (Ares et al., 2011; Carrillo, Varela & Fiszman, 2012; Grunert, 2002; Silayoi & Speece, 2007). Product packaging can thus be used to infer intrinsic product characteristics (Underwood & Klein, 2002). In general, package design elements can be separated into visual- and verbal packaging elements (Silayoi & Speece, 2007). The effects of these stimuli on consumer evaluations will be outlined below.

2.2.1. Visual information

According to Solayoi & Speece (2007), visual stimuli comprise the product design, its colour combinations, pictures, packaging size and shape, typography, and product photography. They generate attention, evoke sensory expectations, affect perception, and transmit and communicate the companies' messages and its underlying meaning (Chrysochou & Grunert, 2014; Underwood, Klein & Burke, 2001). Visual stimuli are associated with the emotional part of the decision making process and those stimuli are often noticed prior to verbal packaging information (Bolen, as cited in Underwood & Klein, 2002; Silayoi & Speece, 2007; Underwood et al., 2001). In addition, these stimuli tend to be more significant than verbal stimuli and may affect consumers' intention to purchase the product (Clement, 2007; Underwood et al., 2001).

Graphics in particular represent concrete data, elicit imagery processing of sensory information and create a total product image (Underwood & Klein, 2002; Underwood et al., 2001). For example, a picture might elicit imaginations of how the product would taste. Another strength of packaging pictures is that

individuals are able to attain meaningful semantic information out of indirect related pictures (Olson & Mitchell, 2000). Moreover, pictures have an indirect effect on the healthiness perception of a product. A study conducted by Chrysochou & Grunert (2014) found that consumers rely more on health imagery than on functional claims when evaluating a product. This might be explained by the vividness of pictures compared to words (Underwood & Klein, 2002). These findings contribute to the belief that in order to promote the consumption of healthful foods, the use of (appropriate) pictures are essential.

2.2.2.Verbal information

Verbal information include information about the product, its attributes and the packaging technology. Packaging technology transmits information about e.g. the degree of environmentally friendly material or whether the product material is microwave safe. The verbal stimuli are more associated with the cognitive part in the decision making process (Silayoi & Speece, 2007). According to Verbeke (2008), consumer choices are greatly influenced by information. Nowadays there is an increased attention towards packaging labels (Silayoi & Speece, 2007). This result might be explained by a growing awareness regarding the relationship between diets and wellbeing. The information conveyed by the package label might favour the consumption of wholesome foods. Although insufficient information might be inaccurate and misleading, too much information might evoke confusion, misuse, misunderstanding, and indifference (Grunert, 2002; Silayoi & Speece, 2007; Verbeke, 2008). Due to limited information processing capacities, excessive information might lead to a cognitive overload (Chrysochou & Grunert, 2014). This indicates that it is essential to provide a balanced amount of information. The communicated benefits throughout nutrition- and health claims directly influence the perceived healthiness of a product. In the next paragraph the effect of different claim types and the way these claims are structured with regard to their informational content and its effect on consumer response will be outlined.

2.2.3.Claim types and the informational content of claims

In general, claims can be divided into two broad categories: nutrition claims and health claims (Verbeke, Scholderer & Lähteenmäki, 2009). The former consists of the added ingredient, whereas the latter can be divided into 'enhanced health' claims (beneficial to health) and 'reduction of disease risk' claims. Nutrition- and health claims can positively affect the healthiness perception of a food product (Chrysochou & Grunert, 2014). Consumers often encounter problems in distinguishing the different types of claims (Nocella & Kennedy, 2012; Van Trijp & Van der Lans, 2007; Verbeke et al., 2009; Williams, 2005). Nevertheless, both Verbeke et al. (2009) and Ares, Giménez & Gámbaro (2009), found in their studies that consumers in general tend to prefer health claims over nutrition claims (Ares et al., 2009; Verbeke, 2009). The study of Grunert et al. (2009) showed that when moving from naming the added ingredient only (nutrition claim) towards mentioning the health benefit (health claim), consumers' purchase interest was growing. According to Williams (2005) this effect might be explained by the difficulties of understanding nutritional information. The author also argued that a lack of nutritional knowledge might lead to a decreased credibility of the claim. However, when the enrichment and its health benefits are familiar amongst consumers, nutrition claims might evoke equivalent inferences as health claims (Chrysochou & Grunert, 2014). These inferences are affected by the presence of functional foods in grocery stores, the history of these functional foods as well as the level of nutritional knowledge of consumers.

Verbeke et al. (2009) also found that consumers tend to prefer both health- and nutrition claims over reduction of disease risk claims. However, other researchers have found the opposite effect, whereby reduction of disease risk claims are preferred over health claims. This might be explained by the prospect theory or health framing literature (Nocella & Kennedy, 2012; Verbeke, 2008). The prospect theory states that expected losses loom larger than expected gains (Kahneman & Tversky 1979). From this theory can be inferred that negative information framing about the potential health risks will more largely influence

(food choice) decisions than information about positive or neutral effects. Yet another study found that consumers have an equal preference for both enhanced- and reduced risk of disease claims (Ares et al., 2009). The contradictions in these reports might suggest that a preference of positive or negative information could also be influenced by additional factors such as the particular health benefit conveyed or the country one comes from (Verbeke et al., 2009).

Although there are distinct types of claims, the way these claims are structured with regard to the informational content might also affect consumers' understanding. However, the type of claim and the length of claims are closely interconnected. E.g. a nutrition claim is likewise a short claim, whereas a claim that includes the ingredient, the function of this ingredient and the expected health benefit is automatically a longer claim.

The length of a claim might lead to misunderstanding, misleading, inference making and/or confusion (Grunert, Scholderer & Rogeaux, 2011; Hasler, 2008; Svederberg, 2002; Van Trijp & Van der Lans, 2007). Although longer claims might be more precise and thus lead to a better understanding, excessive information might also lead to an information overload, confusion (Wansink, Sonka & Hasler, 2004). Moreover, too much information can discourage people to read the information. Shorter claims, on the other hand, are less difficult to process and thus might lead to a better believability and understanding. However, insufficient information might also lead to inference making and can be misleading (Wansink et al., 2004). According to Williams (2005) and Verbeke et al. (2009), consumers generally prefer short, simple and concise claims over complex claims.

Some studies tried to assess the effect of different lengths of claims on consumer evaluations. Cardello (2003) conducted an experiment to study the effect of varying food processing techniques (novel and currently used) on consumers' level of concern and their liking. In the second part of the experiment, he studied whether there were differences in consumers' liking when the product was provided with different information conditions about the used processing technique. The information conditions consisted of: 'name only', 'name + description', 'name + description + benefit'. The results showed a marginal effect in liking, namely; when the information level increased, the decrease in expected liking declined. Furthermore, adding a benefit in the provided information also enhanced consumers' attitude towards the new processing techniques. This effect would suggest that additional information leads to improved evaluations which refutes the statement that consumers in general prefer shorter claims. Lähteenmäki et al. (2010) conducted a similarly experiment whereby the researchers looked at the effect of three claims with a varying level of informational content ('ingredient only', 'ingredient + function' and 'ingredient + function + health outcome') on the attributes naturalness, healthiness, taste, and attractiveness. For the enrichment 'omega-3', the authors found for the dependent variables healthiness, taste and attractiveness the highest ratings when the shortest claim ('ingredient only') was conveyed. For bioactive peptides, this finding was the opposite. Leaving the 'ingredient only' claim type aside, the longest claim type ('ingredient + function + health outcome') was rated higher on healthiness, taste and attractiveness than the 'ingredient + function' claim type. This was the case for both omega-3 and bioactive peptides. However, these differences tend to be minor. Yet another correspondingly study that was conducted by Grunert et al. (2009) reported that the perceived level of understanding and convincingness for either 'short' claims or 'long' claims was more or less equally divided amongst consumers. However, in their study the 'short claim' included only the health benefit. Another study conducted by Wansink et al. (2004) showed that a short health claim (not to be mistaken with a nutrition claim, which is also a short claim) led to a more positive image and a higher believability than a longer health claim. Moreover, the findings of their study also suggested that a short health claim compared to a long health claim led to a better understanding of the benefits of the claim.

Although these studies were designed differently, these inconsistent findings could be explained by the effect of measuring different attributes, consumers' perceived relevance of the communicated benefit, nutritional knowledge, level of involvement, prior beliefs and (un)familiarity with the ingredient. When the level of involvement is high, this might lead to the processing of both visual and verbal stimuli (Underwood & Klein, 2002). Moreover, whether consumers prefer to rely on one or the other type of stimuli or prefer to rely on both stimuli might be affected by an individual's thinking style of processing style. Therefore, this effect will be discussed in the following chapter.

2.3. Cognitive processing style

According to Kollöffel (2012), consumers tend to rely on either verbal or visual stimuli. In addition, the way information is processed is determined by an individual's thinking style and differs among consumers (Kollöffel, 2012). Thinking style can significantly influence food choice, product evaluation and behaviour (Mawad et al., 2015; Ares, Mawad, Giménez & Maiche, 2014). Several theories attempted to research the effect of information processing on people's behaviour, whereas many of them describe a form of dual processing. In general, processing style can be categorized into two broad categories. Kahneman (2003) developed a scheme whereby cognitive process can be divided in two types; System 1 and System 2. System 1 is labelled by intuition and it can be described by automatic, fast, effortless, implicit, and associative processing which involves emotions and is directed by habits. Therefore, System 1 processing is difficult to alter. System 2 is labelled by reasoning, whereby its processing can be regarded as the opposite of System 1. System 2 requires slow, effortful and serial deliberation and processing and takes place more consciously. Therefore, this system is less difficult to alter. A study by Evans (2008), in which he reviewed a variety of dual-processing literature from several disciplines, also acknowledged the concept of dual processing and uses System 1 and System 2 thinking as terms to label the categories of processing information. The fact that individuals not always rely on rational thinking (Thaler, 1980; Tversky & Kahneman, 1986) and thus rely on System 1 when making decisions, could be partially explained by one's limited mental capacity (Kahneman, 1973). Effortful mental tasks are harder to combine with other tasks than effortless mental tasks (Kahneman, 2003). Moreover, Kahneman (2003) argues that individuals are not disciplined to think in-depth.

According to Epstein, Pacini, Denes-Raj & Heier (1996) information is processed by a rational system and an experiential system. In contrast to System 1 and System 2 processing, the authors argue that these systems are parallel, interacting, independent and not inversely related. The influence of one or the other system with regard to informational processing depends on the particular situation as well as people's preference for one of the systems. The degree to which people rely on each of the systems differs among people (Epstein et al., 1996). Nevertheless, the authors argue that the experiential system is the default mode in a particular situation. In order to determine whether individuals are rational or experiential processors, the researchers developed the so-called Rational-Experiential Inventory scale (REI), which consists of two scales. The scale that measures rational thinking is build upon questions of the original Need for Cognition scale (NFC), developed by Cacioppo & Petty (1982). Experiential thinking is measured by questions of the Faith in Intuition (FI) scale, which is developed by Epstein et al. (1996). According to Cacioppo, Petty, Feinstein & Jarvis (1996), need for cognition can be described as '*an individual's tendency to engage in and enjoy effortful cognitive endeavours*'. The Faith in Intuition scale measures the extent to which people trust on their feelings and initial impressions when behaving or decision-making (Shiloh, Salton & Sharabi, 2002). In order to make judgements, those high in Need for Cognition prefer rational, in-depth, and logical information (Cacioppo & Petty, 1982). Moreover, those individuals generally showed to be better copers (Epstein et al., 1996). In contrast, individuals who score high on the Faith in Intuition scale tend to rely on an irrational degree positive thinking. A recent study showed that decision making is affected by the information processing style (Mawad et al., 2015). In this study the dual processing styles

are categorized into field dependence and field independence. Field dependence is approximately equivalent to intuitive thinking, whereas field independence matches the rational processing style. It was found that with regard to the packaging information, the field independent group processed this information more deeply and spent more time evaluating the choice sets before making their decisions. Yet another recent study that was conducted by Ares et al. (2014) whereby the aim was to evaluate the effect of rational and intuitive cognitive styles on consumer choices and information processing when evaluation a food product label, found that information processing and after all food choice are influenced by an individual's thinking style. The researchers found that intuitive thinkers rely more on the graphic design of the packaging label, whereas rational thinkers search for more complex information such as nutritional information or the ingredients list. Moreover, those consumers are likely to process the information on these food labels more deeply.

As can be drawn from prior research, an individual's thinking style could cause consumers to pay attention to different packaging cues. This would imply that individuals with a higher Need for Cognition would rely more on verbal packaging stimuli, whereas individuals with a higher Faith in Intuition would rely more on visual packaging stimuli. According to Sojka & Giese (2006) it can be argued that consumers who prefer to rely visual elements have a tendency to be verbal information averse. In addition, with regard to message framing, a study conducted by Zhang & Buda (1999) showed that consumers that are high in Need for Cognition rated negatively-framed information as more attractive than positive-framed information. For individuals that are low in Need for Cognition, negatively-framed information lowered their judgements to a large extent, whereas positively-framed information improved their evaluations marginally. This outcome is in line with the findings from Epstein et al. (1996), wherein the authors argue that individuals that are high in their Faith in Intuition tend to be overly optimistic.

Although the majority of people prefer either a rational processing style or an experiential processing style, in some situations it may occur that consumers shift to the other processing style. E.g. when an individual's cognitive processing resources are constrained, due to their limited cognitive capacities, consumers are inclined to rely on their affective responses (Scarabis, Florack & Gosejohann, 2006). On the other hand, when an individual is highly motivated or personally involved, consumers tend to search for more information and rely more on their cognitive resources. E.g. a consumer with a high motivation for health and nutrition, is more likely to process health-related information more deeply and extensive processing (Chrysochou & Grunert, 2014).

So in summary, it resulted from prior studies that the understanding of the conveyed health benefits not depends on the combination of the health benefit, the added ingredient, and the product solely (Verbeke, 2009). It seems also to depend, to a large extent, on the type of claim, the way these claims are structured in terms of length and informational content, and on an individual's cognitive processing style. Understanding the relation between an individual's cognitive style and its effect on product evaluation and ultimately food choice could contribute to more appropriate communication strategies which might lead to more wholesome diets (Mawad et al., 2015).

2.4. Integration of literature and hypotheses

Based on the research questions and the literature, hypotheses are established that will be tested by an empirical experiment. As described in previous literature, the package design elements can be divided into visual and verbal packaging elements. In this research, it is decided to focus on food pictures as visual stimuli and on nutrition- and health claims varying in length as verbal stimuli. For each set of hypotheses a conceptual model illustrating the described relationships between the stimuli and the outcome variables is drawn. In this study the short claim represents the nutrition claim which includes the name of the

added ingredient. The medium and the long claim both represent health claims of which the medium claim includes information about the ingredient and its function and the long claim includes information about the ingredient, its function and the beneficial health effect.

The first research question concerns the effects of visual and verbal stimuli on the perceived healthiness of the product. As supported by the literature health imagery tend to be a significant factor in the food choice process. Moreover, literature showed that the effect of health imagery is greater than the effect of nutrition- and health claims (Chrysochou & Grunert, 2014). Therefore, it might be argued that although both factors might be important factors influencing the perceived healthiness, the effect of the visual packaging elements will be more significant. This has led to the establishment of the first hypothesis, which is illustrated in Figure 2:

H_1: Although both visual and verbal stimuli will affect consumers' healthiness perception, in general, visual stimuli will have a greater effect on the products' perceived healthiness than verbal stimuli

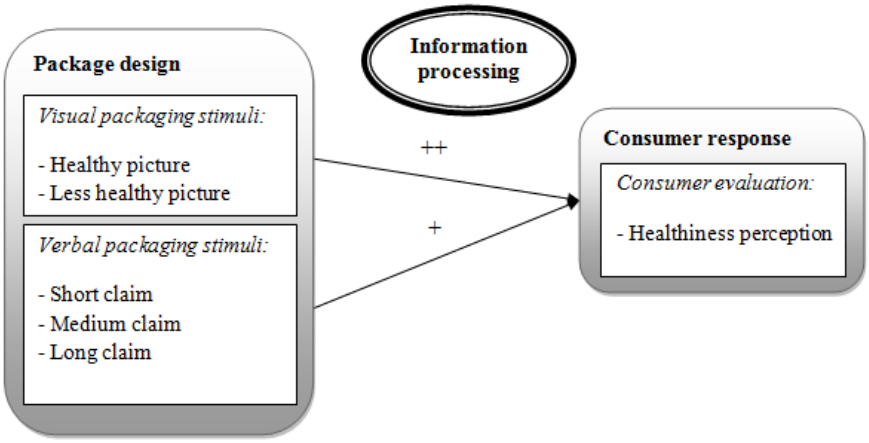

Figure 2: The effect of verbal and visual stimuli on the perceived healthiness

When it comes to the understanding of the health benefits that the claim aims to convey, literature showed that consumers generally tend to prefer health claims over nutrition claims (Ares et al., 2009; Verbeke, 2009). Grunert et al. (2009) argued that consumers' purchase interest increased when the claim contained a health benefit. This might be explained by the difficulties of understanding the health benefits when they are not explicitly conveyed (e.g. only mentioning the enrichment). This explanation was also supported by Williams (2005). Moreover, the results from a study conducted by Cardello (2003) showed that consumers' product liking increased when the claim was longer and encompassed the health benefit. Again, this might also be the result of an improvement in understanding of the health benefits. From these studies can be derived that the longer a claim, the better the understanding of the health benefits of the enrichment. This has resulted in the following hypothesis which is illustrated in Figure 3:

H_2: The longer and more explicitly the claim is explained in terms of the function and its health benefits the better the products' health benefits are understood

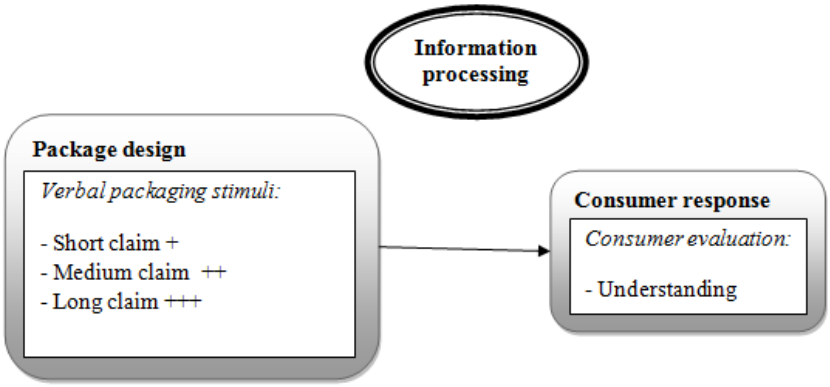

Figure 3: The effect of the three claims on the understanding of the additional health benefits

The third research question is about the trust in a product. When verbal and visual stimuli convey incongruent messages (e.g. a less healthy picture combined with verbal information that communicates the health benefits), it is expected that this will lower the credibility of the product. When additional information in terms of the physiological function and/or health benefit of the enrichment are communicated, the beneficial effects of the product are stated more explicitly or can be more easily inferred from the information. Therefore it is argued that in the case of a more caloric image, when the amount of information in a claim increases this will enlarge the incongruency between verbal and visual information, which in turn will lower the product's credibility. This effect is illustrated in Figure 4 and resulted in the following hypothesis:

H_3: In comparison with the healthy picture, the less healthy picture will, in combination with the presented claims, lower the credibility when the information increases

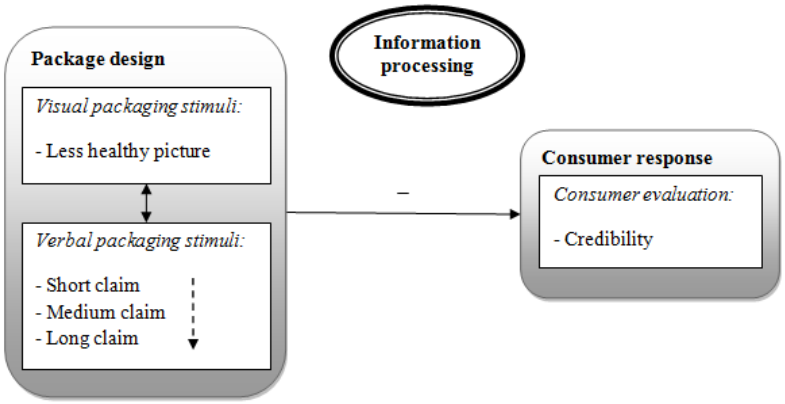

Figure 4: The effect of conflicting verbal and visual stimuli on the credibility of the product

The fourth research question is about the moderating effect of cognitive processing style on the relation between the packaging cues and the perceived healthiness. Therefore, the main effects have to be tested while accounting for the effect of an individual's thinking style. Thus in order to answer the fourth research question several hypotheses are drawn that are described below.

As described in chapter 2.3, individuals that have a high degree of experiential thinking, and hence trust on their intuition when making decisions, rely on the graphic design of a product package. The expectation is that the effect of visual stimuli is moderated by the experiential processing style, which would imply that the reliance of these individuals on the visual packaging elements is more significant than for consumers with a low degree of experiential thinking. This has led to the establishment of hypothesis 4a:

H_{4a}: The effect of visual stimuli on the perceived healthiness is moderated by the experiential processing style, which implies that the effect of the change from a less healthy image to a healthy image is more significant for consumers that are classified as 'high in experiential thinking' compared to consumers that are classified as 'low in experiential thinking'

In addition, it is argued that for these individuals that are high in their Faith in Intuition, the effect of visual packaging cues will outweigh the effect of the verbal packaging cues. It can thus be argued that when those consumers are asked to evaluate the wholesomeness of a product they will rely to a larger extent on visual stimuli compared to verbal stimuli. Moreover, since visual stimuli is received prior to verbal stimuli and individuals with a higher faith in intuition tend to be verbal information averse, it will not be likely that these consumers will search for additional verbal information that support the inferences that can be derived from the product picture (Sojka & Giese, 2006). This would imply that for those respondents that are classified as 'high in experiential thinking' visual stimuli will affect the perceived healthiness more significantly than verbal stimuli. This has led to the following hypothesis:

H_{4b}: The perceived healthiness of consumers classified as 'high in experiential thinking' is to a greater extent influenced by the effect of visual stimuli compared to verbal stimuli

Since consumers with a higher need for cognition are ought to enjoy and engage in deep cognitive processing, it is argued that these respondents tend to prefer additional information prior to their choices. For those consumers it is expected that the effect of additional verbal stimuli will more positively affect their healthiness perception compared to consumers that are classified as 'low in rational thinking' who do not prefer to rely on informational packaging cues and might even be verbal information aversive. Following these arguments, this has resulted in hypothesis 7.

H_{5a}: The effect of verbal stimuli on the perceived healthiness is moderated by the rational thinking style, which implies that the effect of the change from a shorter to a longer claim is more significant for consumers that are classified as 'high in rational thinking' compared to consumers that can be classified as 'low in rational thinking'

Although consumers that can be classified as 'high in experiential thinking tend to be verbal-aversive, in contrast, consumers with a higher level of rational thinking enjoy to rely on and engage in complex thinking. These consumers are inclined to search for more complex information prior to the choice process. It can thus be assumed that for those consumers the effect of verbal stimuli on their perceived healthiness will be more significant than the effect of visual stimuli. This has resulted in the following hypothesis.

H_{5b}: The perceived healthiness of consumers classified as 'high in rational thinking' is to a greater extent influenced by the effect of verbal stimuli compared to visual stimuli

Literature showed that consumers' cognitive processing styles are not exact opposites and instead can act in a more parallel way (Epstein et al., 1996). As a result, some individuals are high on their need for cognition while at the same time also high in their faith in intuition. It is expected that these individuals prefer to rely on both visual and verbal packaging cues in the choice process. Hypothesis 4_b and hypothesis 5_b can thus be combined into the eight' hypothesis following the same conditions as these hypotheses.

H_6: For consumers with both a 'high level of rational thinking' and a 'high level of experiential thinking' an interaction between the visual and verbal stimuli occurs and those consumers will evaluate the package with the healthiest picture and the longest claim clearly as healthiest

In order to illustrate how consumer responses are influenced by both verbal and visual packaging, a conceptual model is developed. It is expected that when consumers process the package design elements, this relation is moderated by an individual's cognitive processing style. Figure 5 shows the conceptual model for hypothesis 4a, 4_b, 5_a, 5_b , and 6.

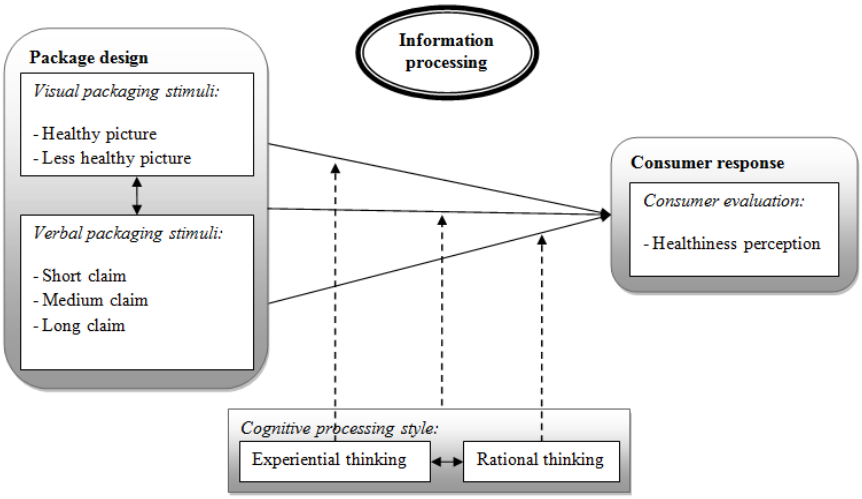

Figure 5: Conceptual model illustrating the effect of package design elements on consumer evaluation with thinking style as a moderator

In order to test these hypotheses, the subsequent step is to collect data. The following chapter will describe what data is needed and how these data will be gathered.

3. Materials and methods

In order to evaluate the effect of the length of the claims and the pictures varying in healthiness on consumers' understanding, credibility and healthiness perception, a survey in the form of a online questionnaire was carried out. The front-of-pack label of an existing liquid margarine brand was used as stimuli. The margarine cooking fat was chosen as the purpose of the study since this product can be used on a daily basis and it is not particularly healthy, which can enlarge the effect of appropriate verbal and visual stimuli and thus facilitates the measurability of these effects. Furthermore, both the product and the nutrition claim (omega-3) already exist on the market, so the outcome cannot be influenced by the novelty of the product and its enrichment.

3.1. Pre-tests

Prior to the final questionnaire, multiple pre-tests were carried out in order to test which images and claims to include on the front-of-pack label conditions. For both the images and claim types, separate pre-tests were conducted.

3.1.1. Selection of images

To determine which images to include in the packaging labels, several pre-tests have been carried out. The aim of these tests were to select two pictures that significantly differed in terms of their perceived healthiness, but nevertheless were approximately equally evaluated in terms of attractiveness. The reasoning behind this was to avoid outcome differences based on a variance on this attribute. The pre-test consisted of an online-questionnaire whereby consumers had to rate different images on the attributes tasty, healthiness and attractiveness. The pre-test questionnaires for the selection of images were made with the program Qualtrics Survey Software, which is a useful instrument for designing online questionnaires. The questionnaire was distributed by e-mail and several other social media. The questionnaire used a 5-point category scale (1 = 'not at all', 5 = 'very much'). The analyses were carried out by the IBM SPSS statistical software program. One-way ANOVA was performed to compare the impact of the four different images on the perceived tastiness, healthiness and attractiveness.

In the first pre-test contained the following images; 'chicken and vegetables', 'salmon and vegetables', 'grilled chicken with extra vegetables', and 'chicken and fries'. The results showed that 'chicken and fries' differed significantly from all the other pictures on the dependent variable 'healthy', but also on the dependent variable 'attractive'. The other pictures did not differ significantly from each other. This implies that the results did not satisfy the criteria of this pre-test. A possible explanation for this large variance could be that the image was created in Adobe Photoshop, which might have affected the attractiveness of the image. Therefore, it was decided to conduct a second pre-test that included a more attractive looking image of baby roast potatoes for the less healthy alternative. In addition, for this second pre-test the original 'chicken and vegetables' image was also included. The dependent variables and the design of the questionnaire were kept unchanged. It resulted from the analysis that the 'chicken and vegetables' image significantly differed from the 'baby roast potatoes' image on all the dependent variables. So again, the conditions were not satisfied. Therefore, a third pre-test was carried out.

For this third pre-test all images of the first pre-test were used, except for the 'fries and chicken' image. In this pre-test the 'fries and chicken' image was replaced by an existing image of baby potatoes. This image was expected to be more appealing than the baby potatoes from the second pre-test. In this pre-test 22 respondents participated. Again, the design and the dependent variables were the same as in the first pre-test. The age of the respondents varied from 21 to 46 years (M = 27.14, SD = 6.73). Of these participants 40 % was male. It resulted from the analysis that a significant difference in 'healthiness' was

found, whereas there no significant difference occurred for 'attractiveness'. In order to find between which images the differences occurred, a post-hoc test was conducted. This analysis showed that the 'baby potatoes' image significantly differed from all the other images on the variable 'healthy', whereas it did not differ significantly on the variable 'attractiveness'. This implied that the criteria of the pre-test were met. Due to the design of the final questionnaire, only two images were selected. The first selected image was the 'baby potatoes' image, since this was the only image meeting the criteria being significantly different from other images in terms of the perceived healthiness. Concerning the selection of the second image, the mean scores were assessed. Although the mean differences for 'healthiness' between 'baby potatoes' and 'chicken and vegetables' (M = 2.45, SD = 0.86 vs. M = 4.32, SD = 0.65) where smaller than the mean differences between 'baby potatoes' and the 'salmon and vegetables' (M = 2.45, SD = 0.86 vs. M = 4.59, SD = 0.50) and 'grilled chicken with extra vegetables' (M = 2.45, SD = 0.86 vs. M = 4.59, SD = 0.50) images, this option was disregarded. Finally, it was decided to include the 'grilled chicken with extra vegetables option, since not everyone might enjoy consuming fish which might influence the results of the main questionnaire. So, the final two selected images for the questionnaire are 'baby potatoes' and 'grilled chicken with extra vegetables'.

3.1.2. Selection of claims

In order to test whether differences between the varying claim lengths were perceived, a similarly pre-test has been carried out. The dependent variables of the test were: 'healthiness', 'persuasiveness', 'understanding', 'credibility', 'a lot of information'. Again, the attributes were rated on a 5-point category scale, ranging from 1 = 'strongly disagree', 5 = 'strongly agree'. In order to determine to what extent the respondents understood the claim, the survey included a question about the understanding. Each respondent rated all four claim lengths. However, to ensure that the respondents in the 'ingredient only' case would not be influenced by the function or the health consequence of the ingredient, the questions appeared in order of their length (with the shortest claim first).

The claims varied in length and informational content. The original product claimed that the product contained three times more omega-3 than olive oil. In order to ensure the credibility of the claims, it was decided to take omega-3 fatty acids as the added ingredient. Furthermore, omega-3 enriched food products are available in the Netherlands for several years, so the outcome will not be likely to be influenced by the novelty of the ingredient. Additionally, the ingredient is multifaceted in terms of health effects (Kris-Etherton, 2003; Simopoulos, 1991). The claims were structured the following: 'short claim' (includes ingredient), 'medium claim'(includes ingredient + physiological function) and 'long claim': (includes ingredient + physiological function + health outcome). The 'medium claim' was based on the brand's explanation of the health outcome of omega-3 fatty acids. Furthermore, this claim has been authorised by the European Commission, Regulation (EC) No 432/2012 (European Commission, 2012). With regard to the 'long claim', cholesterol can be divided into low-density lipoprotein and high-density lipoprotein cholesterol, whereby the former might lead to the development of coronary heart diseases (Downs, Clearfield, Weis, Whitney & Shapiro, 1998; Wilson, Abbot & Castelli, 1988). The latter, in turn, might lead to the improvement of cardiovascular health (Castelli et al., 1986). Since the effect of cholesterol is twofold, this has led to the inclusion of both the positively and negatively framed health claims. So, in order to test which of the two options is perceived best by the respondents and thus will be selected for the final questionnaire, both of the claims were included in the pre-test. The claims for the pre-test were the following: 'omega-3' ('short claim'), 'omega-3 contributes to a normal cholesterol blood level' ('medium claim'), 'omega-3 contributes to a normal blood cholesterol level is therefore good for the health of the cardiovascular system' ('long claim', positively framed), and 'omega-3 contributes to a normal blood cholesterol level and thus reduces the risk of the development of cardiovascular diseases' ('long claim', negatively framed).

In this pre-test 72 respondents participated of which their age ranged from 17 to 51 years (M = 22.72, SD = 7.07). Of these respondents about 11 % were male. In order to analyse the data, an ANOVA has been conducted. With regard to the variables 'healthiness' (F(3, 68) = 0.97, p = .413), 'credibility' (F(3, 68) = 0.85, p = .473) and 'persuasiveness' (F(3, 68) = 2.92, p = .040), no significant differences between the claim lengths were found. With regard to the variables 'understanding' and 'a lot of info', significant differences between the claim lengths were found. A post hoc test was conducted to test between which claim lengths the differences occurred. The results showed that the short claim significantly differed from all other claim lengths. The mean scores of the variable 'a lot of info ' were significantly higher for the two long claims than the mean scores of the short and medium claim. With regard to the two long claims, the negatively framed claim scored higher on all dependent variables than the positively framed claim. Moreover, the mean differences of the short and medium claim lengths were larger for all dependent variables. Therefore, it was decided to select the negatively framed claim as the longest claim for the final questionnaire.

3.2. Main questionnaire

3.2.1. Subjects

All participants were semi-randomly selected throughout the Netherlands. The only criteria for participating in this study was that the respondents are consumers of a margarine-based cooking fat and use this product for preparing meals on a regular base, which means in this case, at least once a week. Therefore, the first question of the questionnaire was aimed at remaining only those respondents who met this criteria. When the respondents indicated that they used the product less than once a week, they were told that they were excluded from the survey. In order to enlarge the participation, respondents were told that they could win a voucher.

The recruitment process was carried out by means of distributing the link of the questionnaire via e-mail, social media (Facebook), social network and several websites. Moreover, the link to the online questionnaire was sent to a data base of the Marketing and Consumer Behaviour group containing approximately 1118 e-mail addresses (students and non-students). In addition, respondents were also recruited amongst employees of an elementary school (G.J. van den Brinkschool) and a grocery store (Albert Heijn) in Wageningen.

The questionnaire was developed by the software program Qualtrics. Therefore, the subjects were able to participate the questionnaire anywhere and anytime. The recruitment process took place for four weeks, since difficulties were encountered with recruiting participants that met the condition of being a regular consumers. At the end of the questionnaire, respondents were thanked and they had to choice to fill in their e-mail addresses to win a €10,- voucher. The total sample consisted of 164 participants. After checking the results, two respondents were removed for further analysis because a particular pattern in their responses was found. So, the final number of the sample consisted of 162 respondents. All respondents were Dutch and their age ranged from 17 to 78 years (M = 43.83, SD = 17.77). Of these participants 21 % were males. The remaining demographics can be found in Table 1.

Table 1: Background characteristics of the sample

	Mean ± SD	
Age (y)	43.83 ± 17.77	
	N	%
Gender		
Male	34	21
Female	128	79
Family composition		
One adult without children	29	17.9
One adults with children	2	1.2
Two adults without children	66	40.7
Two adults with children	47	29
Other (mainly student houses)	18	11.1
Educational level		
No education	1	0.6
Elementary school	4	2.5
Middle school	50	30.9
College	60	37
University	43	26.5
Other	4	2.5

3.2.2. Stimuli

The main stimulus of this study is liquid margarine. In order to enhance task realism, all packaging labels were presented in the context of an existing food product; Becel liquid margarine 'Original'. As mentioned in chapter 3.1, the product attributes of the liquid margarine cooking fat that will be modified in this experiment are:

Product image: as mentioned in the pre-test chapter the product will contain two roughly equal attractive images that vary in their perceived healthiness;

Claim length: three different claims containing the same enrichment were selected, but varied in the extensiveness of the informational content;

The selected attribute levels are the result of the pre-tests (see chapter 3.1). In Table 2 an overview of these attributes and the attributes levels can be found.

A total of 6 (2x3) product label combinations are possible. The manipulated conditions are designed with the graphical editing software Adobe Photoshop and are shown in Appendix I.

Table 2: Product attributes and attribute level

Product attribute	Attribute level	
Image	Healthy image	
	Less healthy image	
Claim length	With omega-3	
	Omega-3 contributes to a normal cholesterol blood level	
	Omega-3 contributes to a normal blood cholesterol level and thus reduces the risk of the development of cardiovascular diseases	

3.3. Measures and procedure

3.3.1. Dependent variables

The survey was divided into four parts. In the first part, the respondents were asked to rate the designed packaging labels. Each single respondent had to evaluate all six packaging labels. In order to avoid that the answers given were influenced by the order of the packages, the order of the packaging labels was counterbalanced across respondents. The respondents evaluated the packaging labels in terms of tastiness, attractiveness, healthiness, willingness to pay, credibility, convincingness of the claim, and understanding of the health benefits. The key dependent variables are healthiness perception, understanding and credibility, whereas the others function as distracters of the research aim. The respondents rated the packaging labels regarding their level of agreement upon the statements (dependent variables) using a 7-point category scale with labels: 1 = not at all, 7 = very much. The complete questionnaire can be found in Appendix II.

3.3.2. Moderating variables

The second part was intended to define the explanatory/moderating variables. This part consisted of completing questions which determined the respondents cognitive thinking style. In order to do this, the revised Rational Experiential Inventory – REI questionnaire was used, which is developed by Pacini & Epstein (1999). The REI is a test to determine whether respondents rely on analytic-rational thinking or on intuitive-experiential thinking. The REI consists of a 'Rationality scale' that contains 20 items that measure the extent of an individuals' 'Need for Cognition' (NFC) (α = .90) and 20 items of the 'Experiential scale' that measures the extent to which an individual relies on 'Faith in Intuition' (FI) (α = .87). Since the focus of the questionnaire were Dutch consumers, a Dutch translation of the REI was used that was created by Witteman, van den Bercken, Claes & Godoy (2009). The data was treated the same as the original questionnaire. All questions were rated on a 5-point scale ranging from 1 = 'completely false', 5 = 'completely true'. The order of the questionnaire had been randomized to minimize the order-effect.

Besides the cognitive thinking style that respondents rely on when processing information, the outcome might also be influenced by an individuals' motives towards food choice. Thus, in the third part of the questionnaire, the respondents had to complete some selected parts of the original Food Choice Questionnaire – FCQ (Steptoe et al., 1995). The original FCQ consists of health related and non-health related motives, namely: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern. However, due to the purpose of this study only the factors *health* (α = .87), *sensory appeal* (α = .70)*, natural content,* (α = .84*), weight control* (α = .79) and *familiarity* (α = .70) were selected. Each of the selected factors consisted of three to six items which sums up to a total of 19 questions. The factors *health, sensory appeals* and *natural* content where already translated into Dutch by dr.ir. PW van Kleef and were taken over. In order to translate the factors *weight control* and *familiarity,* both factors were first translated into Dutch and in order to verify the correctness of the translation, the Dutch translation was translated back into English. Similar to the original FCQ, the questions were rated on a 4-point scale with labels ranging from: 1 = 'not at all important' to 4 = 'very important'. The order of the items was also randomized amongst subjects. However, although these food choice motives are treated as covariates in our study rather than being the main focus of it, due to the clarity of this paper, this part will not be included in the analyses.

Moreover, the outcome of the questionnaire might also be affected by some person-related characteristics. Therefore, the fourth part consisted of a small questionnaire that collected some standard socio-demographic questions. These questions included gender, age and household size/living environment. These data will be treated as a post-hoc measure.

3.4. Data analysis

3.4.1. Main questionnaire

In order to evaluate the hypotheses and sub research questions, the analysis has been carried out with the statistical software program IBM SPSS Statistics 20. Since the goal of this study is to analyse the effect of modified packaging labels on subjects' understanding, healthiness perception and credibility and whether this effect is influenced by the level of a subjects' need for cognition and faith in intuition, a mixed model analysis was performed with the dependent variables as fixed effects and subjects as a random effect. The advantage of a mixed model with respect to general linear models is that this method also accounts for random effects. Since each subject had to rate all possible packaging label combinations, variances in responses can be due to differences between subjects. A random effect can account for these differences. Since there is only one random factor in this analysis, the covariance type was set on 'scaled identity'.

3.4.2. Rational Experiential Inventory

In order to test for interaction effects of cognitive processing style, first the REI questionnaire was analysed. In order to verify that the questionnaire indeed measured two factors (rational thinking and experiential/intuitive thinking), both factors were verified by a factor analysis with varimax rotation. All items were included in the analysis. The first factor (rational thinking) accounted for about 19 % of the variance and the second factor (experiential thinking) for about 14 % of the factor. In order to check the reliability of the factors, both factors should at least contain 10 items with loadings greater than 0.40 (Field, 2009). Although both factors contained more than 10 items with loading greater than 0.40, the individual factor loading of item 17 was 0.13. Therefore it was decided to remove question 17 for further analyses. The internal consistency for the factor that measured rational thinking (α = .87) and the internal consistency for the factor that measured experiential thinking is (α = .89), indicated that both the constructs are found to be highly reliable.

Means scores of these constructs were calculated whereafter basic descriptive statistics of these mean scores were computed in order to classify respondents as high/low in experiential/rational thinking. With regard to experiential thinking, the mean scores ranged from 1.95 – 4.65, with a mean score of 3.45 (*SD* = 0.53). The mean scores for rationality ranged from 2.00 – 4.74, with a mean score of 3.62 (*SD* = 0.54). Since the aim is to derive two equally large groups that are either high or low in a particular thinking style, it is decided to classify respondents based on the median score. Thus concerning the experiential thinking style the split was made at 3.45, whereas the split was made at 3.63 regarding the rational thinking style. Since each respondent filled in all REI questions, they could also be classified into groups that showed how they performed on both thinking styles. The group distributions were approximately equally divided and can be found in Table 3.

Table 3: Number of respondents distributed over both thinking styles

	Experientiality		
Rationality	*Low*	*High*	**Total**
Low	44	33	77
High	39	46	85
Total	83	79	162

4. Analysis and results

In order to answer the research questions and thus the aim of this study, the established hypotheses were tested by the use of statistical analyses. This chapter has been divided into several subchapters. First, the effect of the verbal and visual packaging elements on the outcome variables of this study were analysed. Once significant differences are found, it will be tested whether these differences can be the result of cognitive processing style.

4.1. Main results

A linear mixed model analysis has been performed in order to test the effect of the visual and verbal stimuli on the outcome variables. The results are discussed following the order of the hypotheses.

4.1.1. Healthiness perception

This paragraph will outline the results of the analyses that are derived from hypothesis 1, which states that the visual stimuli will have a greater effect on the products' perceived healthiness than verbal stimuli.

The regression model with perceived healthiness as dependent variable, and 'claim length', 'image' and the interaction between 'image' and 'claim length' as independent variables, shows that there is a significant effect of 'image' with an $F(1, 753.74) = 116.05$, $p = .000$ and a significant effect of 'claim length' with an $F(2, 753.74) = 6.56$, $p = .002$. No significant interaction was found between 'image' and 'claim length' ($p = .975$), which means that the results of the main effects do not depend on each other. The parameter estimates of the 'healthy image' indicate that the packaging labels containing these images positively affect the perceived healthiness of the product, $\beta^* = 0.60$, $t(753.42) = 6.06$, $p = .000$, compared to packages containing the 'less healthy image'. The parameter estimates of 'claim length', show that both the short claim ($\beta^* = -0.26$, $t(753.42) = -2.63$, $p = .009$) and the medium claim ($\beta = -0.19$, $t(753.42) = -1.90$, $p = .058$), have a negative effect on the healthiness perception in comparison with the long claim. These parameter estimates indicate that the longer the claim, the higher the perceived healthiness. The mean scores show that the difference in perceived healthiness between packaging labels containing the long claim ($M = 4.82$) and the package labels containing the medium claim ($M = 4.64$) and the short claim ($M = 4.56$) are both significant, whereas the difference between the medium claim and the short claim is not significant ($p = .350$).

4.1.2. Understanding of the conveyed health benefits

The second hypothesis states that the longer and more explicitly the claim is explained in terms of the function and its health benefits the better the products' health benefits are understood. In this paragraph the results from the analysis following from hypothesis 2 will be outlined.

The regression model of 'understanding', with 'claim length' as independent variable shows that there is a significant effect of 'claim length', $F(2, 776.36) = 69.26$, $p = .000$. The parameter estimates show that both the short claim ($\beta^* = -1.03$, $t(776,34) = -11.56$, $p = .000$) and the medium claim ($\beta^* = -0.36$, $t(776.36) = -4.05$, $p = .002$) have a downwards effect on the level of understanding compared to the long claim. These parameter estimates indicate that the longer the claim, the higher the understanding. The mean scores show that the differences in understanding between packaging labels containing the long claim ($M = 5.23$) and the package labels containing the medium claim ($M = 4.87$) and the short claim ($M = 4.21$) appear to be both significant ($p = .000$ vs. $p = .000$). Moreover, the mean difference in understanding between the medium claim and the short claim also appears to be significant ($p = .000$).

4.1.3.Credibility

In this paragraph the results of the analysis derived from the third hypothesis will be discussed. The third hypothesis stated that in comparison with the healthy picture, the less healthy picture will, in combination with the presented claims, lower the credibility when the information increases.

The results from the analysis showed that only 'image' tend to significantly affect the credibility of the product, $F(1, 768.16) = 62.53$, $p = .000$. The parameter estimates showed that the packaging labels containing the 'healthy image' positively affect the understanding of the additional health benefits ($\beta^* = 0.55$, $t(768,16) = 5.11$, $p = .000$) compared to packaging label containing the 'less healthy image'. 'Claim length' appeared to have a non-significant effect, $F(2, 768.16) = 0.94$, $p = .057$, but the effect tends to be close to significance. Therefore, the analysis was ran again with confidence level of 90% instead of a confidence level of 95% in order to check whether this effect would be significant with a wider confidence level. However, the results indicated that the effect of 'claim less' was still not significant ($p = .057$). Although the p-values of 'claim length' tend to be nearly significant, the mean scores were consulted to check for any significant mean differences between the difference claim lengths. The results indicated that when the claim is longer this resulted in a higher credibility (short: $M = 4.52$; medium: $M = 4.62$; long: $M = 4.71$). However, only the mean difference between the long and shortest claim appeared to be significant ($p = .017$).

Table 4 shows the interaction between image and claim length. Although no significant interaction was found, $F(2, 768.16) = 0.94$, $p = .391$, the numbers from the table indicate that for the packages containing the less healthy picture, the mean credibility increases when the claim is getting longer. However, this effect is not significant and tends to be rather marginal.

Table 4: The interaction between image and claim length on the credibility of the product

Image	**Claim**	M	SEM	95% CI	
				Lower Bound	Upper Bound
Healthy	*Short*	4.71	.10	4.52	4.90
	Medium	4.90	.10	4.70	5.09
	Long	4.99	.10	4.79	5.18
Less healthy	*Short*	4.34	.10	4.14	4.53
	Medium	4.34	.10	4.14	4.53
	Long	4.43	.10	4.24	4.62

4.2. Thinking style as explanatory variable of perceived healthiness

Hypothesis 4 through 6 suppose that the main effects of visual and verbal stimuli on subjects' healthiness perception are influenced (moderated) by the preference for and reliance on a certain cognitive processing style. The paragraphs below will show the results of each of the hypotheses.

4.2.1. Experiential thinking style

Regarding hypothesis 4a, it will be tested whether the effect of visual stimuli is moderated by the experiential/intuitive thinking style. A linear mixed model analysis was performed in order to test whether this hypothesis should be accepted or rejected. The analysis tests whether a significant interaction occurs between the visual packaging cues and the experiential thinking style. Nevertheless, the results showed that this interaction was not found to be significant ($F(2, 384{,}14) = 0.75$, $p = .475$). The regression models of both the 'high- and low in experiential thinking' groups show that for both groups 'image' appeared to significantly affect the perceived healthiness (Table 5). Although, the mean scores indicated that the perceived healthiness for the 'healthy image' significantly differed from the means in perceived healthiness of the 'less healthy image' ($M_{difference} = 0.57$, $p = .000$), this effect occurred for both the groups.

Hypothesis 4b assumes that the effect of healthful visual stimuli on the perceived healthiness is greater for consumers with an experiential/intuitive cognitive style compared to consumers that do not rely on an experiential cognitive style. In order to test this hypothesis, a linear mixed model was performed, whereby the data was split by the two constructs of the REI. In Table 5 the regression models can be found for consumers that are classified as 'high in experiential thinking'. The model shows that 'image' appears to significantly affect the perceived healthiness of the product for the group that is classified as 'high in experiential thinking', $F(1, 362.23) = 65.64$, $p = .000$. The effect of claims on the perceived healthiness of those consumers was not significant, $F(2, 362.23) = 2.69$, $p = 0.069$. Thus, resulting from this analysis it appeared that the effect of 'image' was significant while the effect of the varying claims was not significant.

Table 5: Regression models for groups categorised as 'high or low in experiential thinking'

Experiential thinking	Source	Numerator df	Denominator df	F	Sig.
Low	Intercept	1	145.98	2795.80	.000
	Image	1	388.91	50.00	.000
	Claim	2	388.91	4.19	.016
	Image * Claim	2	388.91	.11	.897
High	Intercept	1	114.21	1692.05	.000
	Image	1	362.23	65.64	.000
	Claim	2	362.23	2.69	.069
	Image * Claim	2	362.23	.12	.883

4.2.1.Rational thinking style

Hypothesis 5a assumes that the effect of claim length on the perceived healthiness is moderated by rational thinking. The results of the analysis showed that a significant interaction was found between verbal stimuli and the rational thinking style, $F(3, 463.6) = 4.44$, $p = .004$. A comparison between the regression models of both the 'high in rational thinking' group and the 'low in rational thinking' group (Table 6) shows that the claim length significantly affected the perceived healthiness for the group categorised as 'high in rational thinking', whereas this effect appeared to be not significant for subjects categorised as 'low in rational thinking. When looking at the effect of the different claim lengths on the mean scores for perceived healthiness, it can be concluded that the group categorized as 'low in rational thinking' evaluated the packages containing the long claim as healthiest ($M = 4.93$), followed by the short claim ($M = 4.87$) and finally the medium claim ($M = 4.79$). However, none of these mean differences significantly differed from each other. In the group classified as 'high in rational thinking', the mean scores for perceived healthiness are highest for the 'long claim' ($M = 4.71$), followed by the 'medium claim' ($M = 4.50$) and the 'short claim' ($M = 4.30$). All of these mean scores are significantly different from each other. This indicates that for rational thinkers a longer claim significantly improved the perceived healthiness.

Hypothesis 5b supposes that for individuals that are high in their Need for Cognition the effect of verbal stimuli on consumers' perceived healthiness is greater than the effect of visual stimuli. The regression model that is derived from the analysis (Table 6) shows that both 'image', $F(1, 390.47) = 74.79$, $p = .000$, and 'claim length' are identified as significant factors affecting the perceived healthiness, $F(2, 390.47) = 10.04$, $p = .000$. However, the F-values indicate that the effect of the visual stimuli is larger than the effect of the verbal stimuli.

Table 6: Regression models for groups categorised as 'high or low in rational thinking'

Rationality	Source	Numerator df	Denominator df	F	Sig.
Low	Intercept	1	118.18	2839.38	.000
	Image	1	361.48	43.30	.000
	Claim	2	361.48	.88	.417
	Image * Claim	2	361.48	.02	.981
High	Intercept	1	141.47	1850.02	.000
	Image	1	390.47	74.79	.000
	Claim	2	390.47	10.04	.000
	Image * Claim	2	390.47	.02	.979

4.2.2.Combined thinking style

Since the rational and experiential thinking style do not mutually exclude each other, some respondents can be classified as 'high in rational thinking' and 'high in experiential thinking'. Hypothesis 8 stated that consumers categorised as 'high in rational thinking' and 'high in experiential thinking' are significantly influenced both by visual and verbal stimuli. The regression model showed that, however, no significant interaction was found between the verbal and visual stimuli and the combined thinking style ($F(18, 564.72) = 1.08$, $p = .374$. The parameter estimates show that for all four possible groups, 'image' appears to significantly affect the perceived healthiness. The output results indicated that the perceived healthiness was significantly higher when the packaging labels contained the 'healthy image' compared to the 'less healthy picture'. Moreover, the model showed that the effect of 'claim length' on the healthiness perception appears to be only significant for those groups that included respondents that were classified as 'high in rational thinking'.

Table 7: Regression models for all possible cognitive style combinations

Combined Thinking	Source	Numerator df	Denominator df	F	Sig.
Low in Both	Intercept	1	86.50	1804.22	.000
	Image	1	211.49	18.60	.000
	Claim	2	211.49	1.33	.266
	Image * Claim	2	211.49	.20	.822
Low Experiential, High Rational	Intercept	1	62.89	1078.05	.000
	Image	1	174.76	33.46	.000
	Claim	2	174.76	5.25	.006
	Image * Claim	2	174.76	.00	.998
High Experiential, Low Rational	Intercept	1	28.7439	1150.95	.000
	Image	1	137.10	24.05	.000
	Claim	2	137.10	.07	.934
	Image * Claim	2	137.10	.10	.905
High in Both	Intercept	1	73.22	822.16	.000
	Image	1	209.67	39.27	.000
	Claim	2	209.67	4.44	.013
	Image * Claim	2	209.67	.06	.939

The results of Table 8 indicate that for all four groups (except for the group that is classified as 'low in both thinking styles') the longer the claim on the package, the higher the perceived healthiness. However, this effect appears to be rather marginal for the 'high experiential, low rational' group. For the 'Low Experiential, High Rational' group, the mean differences between the long claim and the short claim tend to be significant (p = .002). For the group that is classified as 'high in both thinking styles', the mean difference between the longest claim and the shortest claim also tends to be significant (p = .003).

Table 8: Estimated Marginal Means table for all possible cognitive style combinations

Combined Thinking	Claim	M	SEM	df	95% CI	
					Lower Bound	Upper Bound
Low in Both	Short	4.985	.139	148.673	4.710	5.259
	Medium	4.840	.139	148.673	4.566	5.115
	Long	5.048	.139	148.673	4.773	5.322
Low Experiential. High Rational	Short	4.271	.161	111.084	3.953	4.590
	Medium	4.465	.161	111.084	4.147	4.783
	Long	4.740	.161	111.084	4.422	5.059
High Experiential. Low Rational	Short	4.710	.171	66.447	4.369	5.052
	Medium	4.722	.171	66.447	4.381	5.064
	Long	4.770	.171	66.447	4.429	5.112
High in Both	Short	4.328	.172	102.408	3.986	4.670
	Medium	4.527	.172	102.408	4.185	4.869
	Long	4.690	.172	102.408	4.348	5.032

4.3. Post-hoc tests

The outcome of this study might be not the main effects might not be the result of consumers' processing style solely, but might also be influenced by some person-related characteristics. Therefore, the questionnaire included a number of standard socio-demographic questions. These questions included gender, age, educational level and household size/living environment. However, household size will be left out in these analyses.

A linear mixed model analyses was performed whereby the demographics were assigned to be the 'between-subjects' factors and 'image' and 'claim length' as 'within-subject' factors. Since the aim is to test whether the main results were affected by the demographics only the interactions are of interest.

With regard to the gender of the subjects, the regression model showed that no significant interaction effects were measured between gender and image, $F(1, 759.87) = 0.00$, $p = 0.935$, and gender and claim length, $F(2, 759.87) = 1.13$, $p = 0.324$. This indicates that the results of these study are not influenced by the subject being either masculine or feminine.

In order to measure any significant interaction effects of age, subjects were first categorised into a younger age group or an older age group. The split was made at 35 years of which 37 % of the subjects were classified as 'younger'. The regression model of the analysis showed that neither a significant interaction occurred between age and image, $F(1, 758.28) = 3.76$, $p = .053$, nor between claim and age was not significant $F(2, 758.28) = 1.77$, $p = .170$).

With regard to the educational level of the subject, a significant interaction effect between educational level and 'image' occurred, $F(5, 718.22) = 2.97$, $p = .012$. No significant interaction was found between the claims and educational level, $F(10, 718.22) = 0.73$, $p = .701$. However, when analysing the regression model for each of the educational levels, the results showed that 'image' appeared to be significant for all groups (Table 10), which indicates that the effect of the interaction was not moderated by the level of education.

Table 9: Regression model for each educational level

Education_full	Source	Numerator df	Denominator df	F	Sig.
Lower education	Intercept	1	3	26.00	.015
	Image	1	15.00	4.81	.045
	Claim	2	15.00	.34	.719
	Image * Claim	2	15.00	.91	.422
Middle education	Intercept	1	70.83	873.45	.000
	Image	1	220.90	13.68	.000
	Claim	2	220.90	.83	.439
	Image * Claim	2	220.90	.17	.845
College	Intercept	1	107.79	2127.11	.000
	Image	1	270.96	48.69	.000
	Claim	2	270.96	5.39	.005
	Image * Claim	2	270.96	.31	.735
University	Intercept	1	72.58	1197.61	.000
	Image	1	212.81	50.21	.000
	Claim	2	212.81	1.40	.250
	Image * Claim	2	212.81	.06	.942
Other	Intercept	1	8.34	168.86	.000
	Image	1	11.40	8.09	.015
	Claim	2	11.40	.46	.646
	Image * Claim	2	11.40	.38	.694

4.4. Summary of the results

The overall results were discussed in subchapters 4.1 and 4.2. In this subchapter, a short summary of the findings will be discussed by means of the hypotheses. An overview can be found in Table 11.

With regard to the perceived healthiness, both visual and verbal stimuli appeared to affect the healthiness significantly. However, the effect of visual stimuli ($F(1, 755.677) = 116.05$, $p = .000$) was greater than the effect of the verbal stimuli ($F(2, 755.667) = 6.56$, $p = .002$). Therefore, the first hypothesis will be accepted.

When looking at the understanding of the health benefits, the conclusion is that the longer and more extensive the claim, the better the understanding. This implies that the long claim indeed outweighs the short claim (ingredient only) and the medium claim (ingredient + physiological function) in terms of understanding. Consequently, the second hypothesis will be accepted.

With regard to the combined effect of verbal and visual stimuli on the credibility of the product, for both the healthy and less healthy image, the credibility increases when the claim is getting longer. For that reason, hypothesis 3 will be rejected.

Hypothesis 4 stated that the effect of healthful visual stimuli on the perceived healthiness is moderated by the experiential thinking style. However, the results showed that 'image' significantly affected the perceived healthiness for both the 'high and low in experiential thinking' groups. So, for both groups the

inclusion of a healthful image compared to a more caloric image led to a significantly improved perceived healthiness. As a result, hypothesis 4a will be rejected.

The results of the analysis of hypothesis 4b showed that the effect of the visual stimuli appeared to be significant, whereas the effect of the verbal stimuli was not significant. From this can be derived that for consumers that are classified as 'high in experiential/intuitive thinking' visual stimuli will have a greater influence on their perceived product healthiness than verbal stimuli. Therefore, hypothesis 4b will be accepted.

Hypothesis 5a measured whether the effect whether the effect of the verbal stimuli indeed are moderated by the rational thinking style. The results of the analysis indicated that indeed a significant interaction was found between rational thinking and the effect of claims on the perceived healthiness. When comparing the regression models for both the 'high- and low in rational thinking' groups, the findings indicated that the effect of verbal stimuli on the healthiness perception was significant for consumers classified as 'high in rational thinking' whereas this effect was not significant for consumers classified as 'low in rational thinking'. Moreover, for those consumers that are high in their Need for Cognition could be applied that when the claim is longer, the higher their perceived healthiness and these changes appeared to be significant. Therefore, hypothesis 5a will be accepted.

With regard to hypothesis 5b, it was tested whether for individuals that as 'high in rational thinking' the effect of verbal stimuli on consumers' perceived healthiness is greater than the effect of visual stimuli. Contrary to the expectation, both the packaging cues appeared to be significant. Although the F-values showed that the effect of 'image' appeared to be more significant than the effect of 'claim length' these findings indicate that the perceived product wholesomeness of these consumers is significantly influenced by the use of visual stimuli as well as the use of verbal stimuli. Therefore, hypothesis 5b will be rejected.

Since both rational and experiential thinking are not complete opposites, there are consumers that can be classified as being 'high in rational thinking' and 'high in experiential thinking'. Since the results showed that highly rational thinkers perceive the longest claims as healthiest, and highly experiential thinkers perceive the healthy image as healthiest, it would be reasonable to assume that consumers that are classified as 'high in both thinking styles', would perceive the packaging label containing both the healthy image and the longest claims as healthiest amongst all alternatives. The results showed, however, that no significant interaction effect was found. Although it was found that of all six package labels the packaging label including the healthy image and the longest claim was perceived as healthiest for consumers that are classified as high in both thinking styles, this effect appeared not be exclusive to these consumers only. This implies that hypothesis 6 will be rejected.

Table 10: An overview of the acceptance and rejection of the hypotheses

Hypothesis	Accepted or rejected
H_1: Although both visual and verbal stimuli will affect consumers' healthiness perception, in general, visual stimuli will have a greater effect on the products' perceived healthiness than verbal stimuli	**Accepted**
H_2: The longer and more explicitly the claim is explained in terms of the function and its health benefits the better the products' health benefits are understood	**Accepted**
H_3: In comparison with the healthy picture, the less healthy picture will, in combination with the presented claims, lower the credibility when the information increases	Rejected
H_{4a}: The effect of visual stimuli on the perceived healthiness is moderated by the experiential processing style, which implies that the effect of the change from a less healthy image to a healthy image is more significant for consumers that are classified as 'high in experiential thinking' compared to consumers that are classified as 'low in experiential thinking'	Rejected
H_{4b}: The perceived healthiness of consumers classified as 'high in experiential thinking' is to a greater extent influenced by the effect of visual stimuli compared to verbal stimuli	**Accepted**
H_{5a}: The effect of verbal stimuli on the perceived healthiness is moderated by the rational thinking style, which implies that the effect of the change from a shorter to a longer claim is more significant for consumers that are classified as 'high in rational thinking' compared to consumers that can be classified as 'low in rational thinking'	**Accepted**
H_{5b}: The perceived healthiness of consumers classified as 'high in rational thinking' is to a greater extent influenced by the effect of verbal stimuli compared to visual stimuli	Rejected
H_8: For consumers with both a 'high level of rational thinking' and a 'high level of experiential thinking' an interaction between the visual and verbal stimuli occurs and those consumers will evaluate the package with the healthiest picture and the longest claim clearly as healthiest	Rejected

5. Discussion and conclusion

5.1. Discussion

As shown from the theory, obesity and its associated health consequences are influenced by an individuals' diet. One way to prevent obesity and obtain an overall healthy lifestyle and wellbeing is to assist consumers towards making healthier choices. Therefore, the main goal of this study is to understand how the perceived healthiness of a product can be enhanced by the use of visual and verbal stimuli and whether this is affected by cognitive processing style. This overall goal, is divided into sub questions that are used as a guidance for the first part of this chapter. Answering these questions will give more insight and understanding of how visual and verbal stimuli affect consumers product evaluation.

The combined and separate effect of visual and verbal stimuli on the perceived product healthiness and understanding of the conveyed health benefits

With regard to the healthiness perception of the product, the results of the experiment showed that both 'image' and 'claim length' appeared to have a significant effect on the perceived healthiness of the product. The results indicated that a healthier image and a longer and more extensive claim led to a more wholesome product perception. Since the longest claim is a reduction of disease risk claim, its positive effect on the perceived healthiness (compared to the short and medium claims) is in line with the health framing literature that argues that losses loom larger than gains (Nocella & Kennedy, 2012; Verbeke, 2008). The overall results showed that the package containing the least caloric image and the longest claim led to the highest mean perceived healthiness.

Concerning the understanding of the health benefits of the enrichment, the results from the experiment showed that the more extensive a claim in terms of its informational content, the more the understanding of the products' health benefits improved. According to Chrysochou & Grunert (2014) when a certain nutrient and its health benefits are familiar amongst consumers, a nutrition claim might evoke similar inferences as a health claim. So, although omega-3 products are already in the market for quite a few years, these findings suggest that the health benefits from omega-3 itself are not clear among all consumers when the enrichment is mentioned merely as a verbal stimulant. Moreover, another interesting finding was that 'image' also significantly affected the understanding. A potential reason for this is that the inclusion of a healthier image could reinforce the understanding due to inferences that can be drawn from the image.

In what way do food pictures (healthy vs. unhealthier) in combination with the amount of information in a claim affect the credibility of a product?

The expectation regarding the trust in a product was that the more caloric image in combination with a longer claim would decrease the credibility. The findings of the experiment however, did not support this expectation. Despite the expectations, the less healthy image in combination with a longer claim increased the credibility. This effect also occurred for the healthy image, but the effects for both images tend to be minor. From this can be inferred that a longer claim leads to an increased credibility, regardless of the type of image.

In what way does cognitive processing style interact with the relationship of the informational amount of claims, the use of different food pictures and the combination between these visual and verbal stimuli on a products' perceived healthiness?

As resulted from the analysis, the positive effect of the healthy image on the perceived healthiness is not moderated by thinking style. The results indicated that the significant effect of visual stimuli was

applicable for all cognitive processing styles. A possible reason for this effect might be that product imagery are difficult to ignore when evaluating a choice set. This explanation is in line with the articles of Bolen, as cited in Underwood & Klein (2002) and Clement (2007) who argue that the effect of visual packaging element is more significant than the effect of verbal packaging elements. Moreover, the authors state that these visuals are perceived prior to the verbal information. In addition, Epstein et al. (1996) advocates that the experiential system is the default mode. These arguments suggest that, regardless of one's thinking style, visual packaging elements are nearly always perceived since these stimuli are highly noticeable and thus difficult to ignore. Verbal packaging elements, on the other hand, might only be perceived by consumers that have a high need for cognition, are motivated and highly involved with health and nutrition or are not limited in their cognitive capacities (Scarabis, Florack & Gosejohann, 2006; Chrysochou & Grunert, 2014).

The effect of a change in claim length on the perceived healthiness was found to be moderated by the rational thinking style. Subjects' that were classified as 'high in rational thinking' appeared to be significantly affected in their perceived healthiness by the verbal packaging elements, whereas this effect was not found to be significant for subjects that were classified as 'low in rational thinking'. This finding is largely in accordance with the study of Ares et al. (2014) who found that consumers that are 'high in experiential thinking' rely more on the visual aspects of the packaging label, whereas consumers' that are 'high in rational thinking' relied more on the verbal aspects of the packaging label. This effect could possibly be explained by the reasoning that intuitive thinkers might have an aversion for verbal information (Sojka & Giese, 2006). Although consumers that are low in their need for cognition are not identical to intuitive thinkers, the results of this study showed that the number of subjects that can be categorised in each of the four combined cognitive processing style groups are approximately evenly distributed, which partly explains this effect.

5.2. Limitations and recommendations for further research

5.2.1. Limitations with regard to study design

This study also encountered some limitations that have to be acknowledged. Firstly, with regard to the sample of the study, the sample does not appear to be representative. Due to the recruitment method, a large part of the sample consists of students. Moreover, the majority of the participant sample consists of women which are significantly affected by 'claim length', whereas this effect does not apply to males. However, although the male-female ratio was not evenly distributed, women are often the persons who that take care of the groceries and will thus be to a larger extent exposed and influenced by the visual and verbal packaging elements. Regarding the sample size, the total number of respondents is rather small (162 respondents) and might therefore not be very representative for consumers throughout the Netherlands.

Secondly, with regard to the packaging labels, in this study respondents had to evaluate all six packages. However, this effect might not be problematic since consumers also view numerous packaging in-store, which ultimately is the environment wherein consumers have to make their choices. Since the differences between the claim lengths were minor, this has led to some confusion amongst respondents. A part of the sample had the idea that they had to fill in six similar packages might have influenced the answers. On the other hand, these consumers might also be the consumers that rely to a greater extent on the visual packaging elements instead of the verbal packaging elements. Moreover the order of the packages was randomized which might have influenced the understanding of the health benefits of the enrichment. It was thus possible that subjects evaluated the package label containing the longest claim (nutrient +

function + health outcome) before the package label containing the enrichment. In that case, these consumers would have been biased with respect to the question about their level of understanding.

Third, since the questionnaire consisted of several parts, the length of the questionnaire was a little too extensive. For some respondents the completion time of the questionnaire was more than 10 minutes which does not contribute to the validity of the given answers. At the end of the questionnaire, it is likely that some respondents randomly entered answers. Since it was decided to include questions about the food choice motivators that are due to the purpose of this study taken out of the analysis, it would have been better if these questions were left out of the questionnaire.

5.2.2. Recommendations and implications

This study has gained some important implications for practice. The results of the analyses highlighted the importance of visual packaging elements. The findings of this study showed that visual stimuli outweighed the effect of the verbal stimuli. So, in order to stimulate healthier food choices, healthful visual stimuli should be regarded as a precondition for packaging design. Moreover, this study showed that the effect of verbal stimuli also appeared to be important, although the degree of this effect is dependent on the cognitive rational processing style. It resulted that longer claims are more effective in terms of changing consumers healthiness perception than shorter claims. It should thus not be assumed that consumers nutritional knowledge is sufficient with regard to the understanding of the health benefits of the enrichment. Thus in order to stimulate healthier dietary choices the visual and verbal packaging elements should be taken into account.

Since no extensive research has been done towards the effect of cognitive processing styles on the evaluation of the verbal and visual packaging cues, it would be of interest to replicate this study for another product category and test whether the finding would correspond. Moreover, a following-up study could include more product images that can be categorized as 'healthy' or 'unhealthy' to test whether the difference in the outcome might not be the affected by these particular images, but instead to the level of their wholesomeness.

5.3. Conclusion

The aim of this study was to enhance the products' perceived healthiness and the understanding of the health benefits of the product, without lowering the credibility of the product. Concerning the effect of the visual packaging elements, the findings of this study confirmed that a healthy image, compared to a less healthy image significantly improved the perceived healthiness and credibility of the product. Although the moderating effect of cognitive processing style regarding visual stimuli was not confirmed, the results indicate that the effect of product imagery is substantial, independently of a particular processing style. With regard to the effect of the verbal packaging elements, the results confirmed that refraining from a nutrition claim towards a (more extensive) health claim improved the perceived healthiness and the understanding significantly, without lowering the credibility of the product. In addition, the effect of claim length on the perceived healthiness of the product was found be to be moderated by the rational cognitive processing style. Subjects that were classified as high in their need for cognition were significantly affected by the change of the verbal stimuli, whereas this significant effect did not occur for consumers that were low in their need for cognition.

Overall, it can be concluded that in order to stimulate a healthy diet and support consumers towards healthier choices, it is essential to pay attention to both packaging elements. The results of this study showed that a healthy image in combination with the longest claim led to an enhanced healthiness

perception. Although the length of the claim is related to an individual's thinking style, in general, the product containing the longest claim length and healthiest image led to the highest perceived healthiness.

To conclude, this study contributes to the scientific literature, since little research has been carried out towards the moderating effect of cognitive processing style on the relation of packaging elements and consumers' product evaluation. Furthermore, this study can be assessed as valuable in the combat against obesity and its negative health consequences, because the findings of this study confirmed that both visual and verbal stimuli are essential towards enhancing the perceived products healthiness.

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Appendix I

Overview of the manipulated product label combinations varying in image and claim length

Appendix II

Questionnaire

<u>Introductie</u>

Beste deelnemer,

Hartelijk dank voor uw deelname aan dit onderzoek! Het onderzoek zal bestaan uit verschillende delen. In het eerste deel van het onderzoek wordt u gevraagd 6 verschillende productverpakkingen van vloeibare margarine te beoordelen. Daarna worden u enkele vragen gesteld over hoe u omgaat met beslissingssituaties. In het derde onderdeel van het onderzoek willen we onderzoeken welke aspecten men belangrijke acht bij het kiezen van voedsel en in het laatste deel worden enkele algemene vragen gesteld over uzelf. Voor dit onderzoek zoeken we consumenten die minimaal 1 keer per week vloeibare margarine gebruiken voor het bereiden van de (avond)maaltijd.

Het invullen van de vragenlijsten zal ongeveer 10 minuten in beslag nemen. Uw anonimiteit zal gewaarborgd blijven en uw antwoorden zullen enkel voor wetenschappelijke doeleinden worden gebruikt. Wanneer u aan het eind van de vragenlijst uw e-mailadres invult, maakt u kans op een waardebon t.w.v. €10,-. Alvast bedankt voor het invullen van de vragenlijst!

Q1 Hoe vaak gebruikt u vloeibare margarine voor het bereiden van uw (avond)maaltijd?(Indien u 'minder dan 1 keer per week' invult, behoort u helaas niet tot de doelgroep van dit onderzoek)

- ❍ Minimaal 1 keer per week
- ❍ Minder dan 1 keer per week

Met het eerste vragenlijstje willen we onderzoeken hoe men verschillende productverpakkingen beoordeelt op verschillende aspecten.

Beeldt u zich nu in dat u in de supermarkt bent om vloeibare margarine te kopen. Bekijkt u alstublieft elke verpakking zorgvuldig. Kruis uw antwoord aan op de schaal van 1 t/m 7, waar '1' betekent dat u het helemaal niet eens bent met de stelling en '7' dat u het heel erg eens bent met de stelling.

Q2Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q3 Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q4 Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q5 Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q6 Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q7 Beoordeel het onderstaande product op de volgende stellingen:

	Helemaal niet			Neutraal			Heel erg
Dit product is smakelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is aantrekkelijk	❍	❍	❍	❍	❍	❍	❍
Dit product is gezond	❍	❍	❍	❍	❍	❍	❍
Ik zou bereid zijn dit product te kopen	❍	❍	❍	❍	❍	❍	❍
Dit product is geloofwaardig	❍	❍	❍	❍	❍	❍	❍
De gezondheidsclaim op dit product is overtuigend	❍	❍	❍	❍	❍	❍	❍
Ik begrijp de gezondheidsvoordelen die dit product wil overbrengen	❍	❍	❍	❍	❍	❍	❍

Q8 Met het volgende vragenlijstje willen we onderzoeken hoe mensen omgaan met beslissingssituaties. Wilt u reageren op de uitspraken zoals deze betrekking hebben op uw leven in het algemeen. Uw antwoorden zouden moeten overeenkomen met de manier waarop u over het algemeen beslissingen neemt.

Kruis uw antwoord aan op de schaal van 1 t/m 5, waar '1' betekent dat u het er niet mee eens bent en '5' dat u er geheel mee eens bent.

REI 1

	Niet mee eens				Geheel mee eens
Ik probeer situaties te vermijden waarin je heel diep over iets moet nadenken	❍	❍	❍	❍	❍
Ik ga graag af op mijn intuïtie	❍	❍	❍	❍	❍
Het werkt meestal goed als ik bij het ontrafelen van de problemen in mijn leven op mijn gevoel afga	❍	❍	❍	❍	❍
Ik ben niet zo goed in het uitpluizen van ingewikkelde problemen	❍	❍	❍	❍	❍
Ik vind een intellectuele uitdaging leuk	❍	❍	❍	❍	❍
Wat vertrouwen van mensen betreft, kan ik meestal op mijn gevoel afgaan	❍	❍	❍	❍	❍
Ik ben niet erg goed in het oplossen van problemen waar zorgvuldige logische analyse voor nodig is	❍	❍	❍	❍	❍
Ik heb vertrouwen in mijn voorgevoelens	❍	❍	❍	❍	❍
Intuïtie kan heel bruikbaar zijn voor het oplossen van problemen	❍	❍	❍	❍	❍
Ik volg vaak mijn instinct bij het nemen van een beslissing over wat ik zou gaan doen	❍	❍	❍	❍	❍

REI 2

	Niet mee eens				Geheel mee eens
Ik houd er niet van veel te moeten nadenken	❍	❍	❍	❍	❍
Meestal kan ik duidelijk en helder de redenen van mijn beslissingen uitleggen	❍	❍	❍	❍	❍
Ik vertrouw op mijn eerste indruk van mensen	❍	❍	❍	❍	❍
Ik heb niet zo'n heel goed intuïtief gevoel	❍	❍	❍	❍	❍
Nadenken is niet mijn idee van een plezierige activiteit	❍	❍	❍	❍	❍
Als ik op m'n gevoel zou afgaan, zou ik vaak fouten maken	❍	❍	❍	❍	❍
Ik zou graag nieuwe manieren leren om na te denken	❍	❍	❍	❍	❍
Dingen zorgvuldig op een rijtje zetten is niet één van mijn sterke punten	❍	❍	❍	❍	❍
Ik heb liever ingewikkelde dan eenvoudige problemen	❍	❍	❍	❍	❍
Ik houd niet van situaties waarin ik op mijn intuïtie moet afgaan	❍	❍	❍	❍	❍

REI 3

	Niet mee eens				Geheel mee eens
Ergens diep over nadenken geeft me weinig voldoening	❍	❍	❍	❍	❍
Ik vind het geen goed idee om bij belangrijke beslissingen op je intuïtie af te gaan	❍	❍	❍	❍	❍
Ik denk dat er momenten zijn dat je op je intuïtie af moet gaan	❍	❍	❍	❍	❍
Ik kan onder druk niet zo goed nadenken	❍	❍	❍	❍	❍
Ik ben beter in het logisch uitwerken van dingen dan de meeste mensen	❍	❍	❍	❍	❍
Ik zou niet graag afhankelijk willen zijn van iemand die zichzelf als intuïtief beschrijft	❍	❍	❍	❍	❍
Ik heb er geen probleem mee dingen zorgvuldig te doordenken	❍	❍	❍	❍	❍
Ik denk dat het dom is belangrijke beslissingen te nemen op basis van je gevoelens	❍	❍	❍	❍	❍
Mijn eerste indrukken zijn waarschijnlijk niet zo betrouwbaar als die van de meeste mensen	❍	❍	❍	❍	❍
Ik kan goed logisch nadenken	❍	❍	❍	❍	❍

REI 4

	Niet mee eens				Geheel mee eens
Ik heb de neiging om mijn hart te volgen	❍	❍	❍	❍	❍
Ik vind het leuk in abstracte termen te denken	❍	❍	❍	❍	❍
Ik kan meestal aanvoelen of iemand gelijk heeft of niet, ook al kan ik niet uitleggen hoe ik dat weet	❍	❍	❍	❍	❍
Het werkt bij mij goed om problemen in mijn leven logisch te beredeneren	❍	❍	❍	❍	❍
Over het algemeen vertrouw ik niet op mijn gevoel bij het nemen van een beslissing	❍	❍	❍	❍	❍
Ik zit bijna nooit fout als ik naar mijn instinct luister om een antwoord te vinden	❍	❍	❍	❍	❍
Het is voor mij voldoende om het antwoord te weten zonder precies de achterliggende redenering te begrijpen	❍	❍	❍	❍	❍
Ik vind het leuk problemen op te lossen waar je diep over na moet denken	❍	❍	❍	❍	❍
Ik vermoed dat mijn voorgevoelens net zo vaak niet correct zijn als wel	❍	❍	❍	❍	❍
Ik ben niet zo'n analytische denker	❍	❍	❍	❍	❍

Met het volgende vragenlijstje willen we onderzoeken welke aspecten men belangrijk acht bij de keuze voor voedsel op een typische dag.

Kruis uw antwoord aan op de schaal van 1 t/m 4, waar '1' betekent dat u het helemaal niet belangrijk vindt en '4' dat u dit heel belangrijk vindt.

Q9 Geef aan in hoeverre je de volgende aspecten belangrijk vindt bij het kiezen van voedsel voor een doorsnee dag

	Helemaal niet belangrijk	Een beetje belangrijk	Redelijk belangrijk	Heel belangrijk
Bevat veel vitamines en mineralen	❍	❍	❍	❍
Houdt me gezond	❍	❍	❍	❍
Is voedzaam	❍	❍	❍	❍
Bevat veel eiwitten	❍	❍	❍	❍
Is goed voor mijn huid/tanden/haar/nagels etc.	❍	❍	❍	❍
Is rijk aan vezels	❍	❍	❍	❍
Ruikt lekker	❍	❍	❍	❍
Ziet er leuk uit	❍	❍	❍	❍
Heeft een aangename textuur	❍	❍	❍	❍
Smaakt goed	❍	❍	❍	❍
Bevat geen toevoegingen	❍	❍	❍	❍
Bevat natuurlijke ingrediënten	❍	❍	❍	❍
Is caloriearm	❍	❍	❍	❍
Helpt me mijn gewicht te beheersen	❍	❍	❍	❍
Is vetarm	❍	❍	❍	❍
Is wat ik doorgaans eet	❍	❍	❍	❍
Is net als het eten dat ik at toen ik een kind was	❍	❍	❍	❍

Q10 Wat is uw geslacht?

- ❍ Man
- ❍ Vrouw

Q11 Wat is uw leeftijd?

……..

Q12 Hoe ziet uw huishouden eruit?

- ❍ 1 volwassene
- ❍ 1 volwassene met kind(eren)
- ❍ 2 volwassenen zonder kinderen
- ❍ 2 volwassenen met kind(eren)
- ❍ Anders, namelijk _____

Q13 Wat is uw hoogst voltooide opleiding?

- ❍ Geen opleiding
- ❍ Lager (beroeps) onderwijs
- ❍ Middelbaar (beroeps) onderwijs
- ❍ Hoger (beroeps) onderwijs
- ❍ Universiteit
- ❍ Anders, namelijk: ..... _____
- ❍

Q14 Heeft u opmerkingen over dit onderzoek?

……..

Q15 Bedankt voor uw deelname aan dit onderzoek! Wilt u kans maken op een waardebon t.w.v. €10,-?

- ❍ Ja, mijn e-mailadres is: _____
- ❍ Nee