The explicitness of health messages on food labels: A field experiment

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Table of Contents

Abstract

Nowadays, we often encounter with the fact that many consumers eat unhealthy food products and the population put on weight. To prevent this situation, there could appear a solution how to avoid the obesity and overweight problem, for instance, by front-of-pack labelling helping consumers with finding the healthy food product. This study aimed to investigate whether explicit or implicit health messages are more effective in guiding consumers to make healthier food choice. We examined the effects of explicit and subtle health messages on food choice in order to assess how the message on a food package can best influence a consumer´s choice towards healthy food. We conducted a between-subjects design with four conditions used in a field experiment: (1) explicit health information, i.e. ´This is healthy choice', (2) moderately implicit health information, i.e. 'seal of approval´, (3) extremely implicit health information, i.e. green colour on package, (4) control condition with no health information. In our field experiment (N = 417), the percentage of consumers choosing healthy cookies was lower than chocolate cookies. The choice of cookies did not differ across conditions, and consumers' choice was, thus, not affected by the use of different health messages. Additionally, it seems that the age had a significant impact on consumers' choice. Older participants were more likely to choose healthy cookies. Also, the extent to which healthy eating was important for participants had a (marginally) significant impact on choice. Participants for whom healthy eating was important were more likely to choose healthy cookies. In this study, we find no evidence for an effect of the explicitness of health messages on food choice. In the discussion, we elaborate on how our findings relate to previous studies and we discuss the limitations and implications of our study. The topic of explicitness of health messages is relatively new in the field of health claims. As a result, more research needs to be conducted in this area to examine the effects of the explicitness of front-of-pack labels on food choice.

Keywords: explicitness, health message, consumer, food choice

1 Introduction

An increasing number of people suffer from nutrition related diseases such as obesity, some cancers and cardiovascular diseases. They belong to the most challenging health concerns of our time (Feunekes et al., 2008). Communicating intuitive and simple nutrition information, by means of symbols and labels on food packages, is increasingly seen as an essential tool in the effort to combat unhealthy food choices and improve public health. Organisations, such as the World Health Organisation and the European Commission, are in favour of providing consumers with understandable and clear information on the front of the package (i.e. front-of-pack nutrition labels). This can help consumers identify the healthy food choices across and within product categories. The idea behind front-of-pack nutrition labelling is that key information easily catches the attention of the consumer and is easy to understand. Labels have to be comprehensible and contain enough nutrition information (Hodgkins et al., 2012).

Detailed nutrition information at the back of food packages does not typically attract much attention from consumers. Similarly, with front-of-pack nutrition labels, they all try to communicate the nutritional quality of a food in a simplified way and help consumers to improve their purchase decisions (van Trijp, 2009). Kozup et al. (2003) suggested that the health claims they used in their experiment on restaurant menus and also packaged foods aroused very positive attitudes towards a product and increased people's intention to buy the products. Moreover, consumers find food products with health claims 'more nutritious' as compared to foods without health claims (Kozup et al., 2003, p. 32). Health claims and nutrition information can be used in assisting in better complex evaluation of the product before the food choice, but it also depends on having enough motivation (Kozup et al., 2003). A very important question is how healthy information can best be communicated to consumers.

The way health information is presented on food packages differs on a number of dimensions (Lytton, 2010). A key dimension is the *explicitness* of the provided information. Explicitness might have either positive or negative effects on persuasion. According to O'Keefe (1997), explicitness in persuasive messages refers to the degree of articulation of the 'overall standpoint' or recommendation that the message contains. In other words, O'Keefe (1997) argues that the extent to which one can be precise and concrete in one's advocated opinion, the better one might persuade another person. Still, the effect of explicitness is moderated by context – such as the degree of involvement or intellectual capability of a person concerned in a conversation with a persuader. O'Keefe (1997) showed that direct language essentially strengthens persuasion. Dillard and Shen defined explicitness as 'the degree to which the language of the message' makes it clear to the receiver what one intends to communicate (2005, p.163). They illustrate an explicit announcement by means of the difference between explicit language using words such as "should", "ought" or "must" and less-explicit language includes words such as "could", "would" or "may" (Miller et al., 2007). However, sometimes strong words may impair the persuasion because they might be too forcible and, therefore, they should be replaced by more neutral assertions (O'Keefe, 1997).

In the domain of health information on food packaging, Hodkings et al. (2012) called a related dimension of explicitness 'directive-ness'. In other words, the amount of information simply guides consumers what they can do and how they can decide regarding food choices. Thus, the directive-ness' can be seen as the extent to which consumers are directed towards the conclusion that a product is healthy. They pointed out that this dimension is of key importance to consumers. In their research they showed that the more directive and explicit the information (and thus the more aggregated), the higher its acceptance by consumers (Hodgkins et al., 2012). Aggregated claims assist consumers in simplifying and summarizing the nutrient information provided on the package. Pictures and approval symbols are used to inform the consumer about the nutritional value of the product (Lytton, 2010). Furthermore, if the front-of-pack labelling scheme is directive consumers themselves do not need to integrate pieces of nutrition information and come to an overall conclusion. Very direct messages or labels are explicit in stating whether the product is healthy or not. When asked for their opinion, consumers often emphasize that they want a simple and easy to understand label (Silayoi and Speece, 2007; Feunekes et al., 2008).

Consumers select food every day. People sometimes make balanced choices or rational food decisions. But only when consumers have enough time and motivation they can make such a deliberate choice. Before they decide and make a choice, consumers consider various objectives and goals such as healthiness, tastiness, and price when they have time and motivation. On the one hand, people choose food because they want to keep themselves healthy. Moreover, consumers are interested in a tasty snack. Finkelstein and Fishbach (2010) argue that people need to cope with this so-called conflict between health and indulgence. Since consumers face symbolic messages indicating healthy eating, they can essentially select among healthy and unhealthy options.

A recent field study of Wagner et al. (2014) showed that subtle messages, such as simple graphics are more effective in encouraging consumers to choose healthy when they have the choice between candy bars and apples and other food. In one of their studies, they manipulated the label of apples such that they (1) explicitly mentioned that the 'food was healthy', (2) implicitly suggested it was healthy by using an image, or (3) did not state health. The participants at a conference were more inclined to select an apple in case of the subtle health message.

It is not clear what underlying mechanisms explain the effects found in the study of Wagner et al. (2014). Our study replicates this study of Wagner et al. (2014). Is it that subtle messages are easier to process (process fluency) or unconsciously activate health goals? Explicit information may be more likely to be processed consciously which may lead to reactance as there is less space for personal interpretation. Explicit messages may also lead to less trust in the message or lower taste expectations (Wansink et al., 2004). Finkelstein and Fishbach (2010) proposed a solution by offering 'subtle encouragements' that would diminish negative reactions.

The aim of this study is to investigate whether explicit or implicit health messages are more effective at communicating health to consumers in order to guide healthier consumer food choices. This thesis examines the effects of explicit and subtle health messages on food choice and how the message on a food package can best influence a consumer´s choice towards healthy food.

We conducted a field study in which consumers were presented with cookies accompanied by health messages which differed in a level of explicitness. In the following we first bring forward a theoretical chapter with an explanation of the relevant concepts and examples of front-of-pack nutritional labels, different ways in which consumers process information of nutritional labels and how explicitness can affect the choice or persuasiveness. We then present our method of data collection and the results of the field study. Through the main research question of how explicitness of a health message on food packages can affect the consumer's choice we try to find out how healthy information can best be communicated with consumers in order to stimulate them to buy the healthiest food option.

2 Theoretical chapter

2.1 Indicators of healthiness of food on package

There are several examples of types of claims and formats which communicate information about health to consumers. Three types of claims concerning foods and its context within European Union countries were defined in the European Commission Regulation 1924/2006 (European Commission, 2006). The regulation differentiates amongst health claims, nutrition claims, and disease risk factor reduction. All three types differ in their design and purpose for labelling of food. Health claims show a relationship between 'food, or one of its components and health' (e.g. omega-3 and brain benefits). Nutrition claims indicate how the product is nutritionally composed (e.g. low fat, high in fibre). Disease risk factor reduction embodies a peculiar category of health claims implicating that 'food or one of its components significantly reduces a risk factor for human disease' (e.g. Wills et al., 2012, p. 229).

The main idea of this research is to focus on general front-of-pack labels indicating health. Feunekes et al. (2008) demonstrated that front-of-pack labelling formats are liked, comprehensible and credible throughout studied European countries. However, they also pointed out that the complex front-of-pack labelling formats may require more concentration for less knowledgeable groups of consumers. Ultimately, they recommended mentioning simple labelling schemes on front-of-package and nutritional data more into the detail placed on the back-of-pack (Feunekes et al., 2008; Kozup et al., 2003).

The European Union strives for clarification and non-ambiguity of nutrition and health benefits of foods. Some people perceive nutrition claims as added value (Williams, 2005), meaning that they perceive the food as including some beneficial ingredients or containing fewer nutrients as recommended. As a result, nutritional claims could contribute to a positive effect on consumer behaviour, consumer consciousness in complexity of nutrition information and they could jointly assist in better public health. Nevertheless, there are more elements that have an impact on actual consumer behaviour such as taste, brand, price or packaging of the product itself (Leathwood et al., 2007; van Trijp, 2009; Wills, 2012). To be complete, there are also other studies showing that labels and claims have a little effect on consumer's choice . For instance, consumers could buy food products in cafeterias and they rather chose foods without attached choice logos. Thus, there was not effect of logo on food products sold in the cafeterias (Vyth et al., 2011).

Categorizing health information according to the explicitness

Some nutrition labels give norms on how much of the product is recommended to consume, while others simply summarize overall healthiness. The difference can be demonstrated on signpost logos (e.g. health tick, three stars system) and guidelines daily amounts (GDA). Signpost logos only indicate the healthy choice through a picture. However, for instance, GDA provide a consumer

with real nutrient data. The health messages that consumers are exposed to also differ in a certain level of explicitness.

Explicit health information on food packages

First, some products have explicit health messages stating this is a 'healthy food' or the 'healthy choice'. This health information directly qualifies a food option as the most appropriate for consumers. Provencher et al. (2009) demonstrate, on similar caloric content meals with and without 'healthiness', messages that messages claiming healthy benefits lead to perceptions that the food is healthier and this in turn leads to increased food consumption. Moreover, foods with a health claim were perceived as not only healthier but also as more unlikely to be fattening.

A study of Gravel et al. (2012) showed how strong an influence 'hedonic', 'healthy' and 'diet' labels have on cookies. The cookies with a verbally explicit healthy message were perceived as healthier. The manipulation did not impact food intake. Although the food can be less healthy (cookies), it is still deemed as healthier choice when the explicit health message is used (Gravel et al., 2012). Nevertheless, "healthy" is perceived by consumers as less tasty (Jacquot et al., 2013; Wansink et al., 2004). Moreover, Chrysochou and Grunert (2014) examined three possible communication channels how health can be transferred to consumers. First, through direct information that product is healthy ('functional claims') the consumer is motivated to purchase the food product. Second, the consumer is informed by means of indirect information about various processing dimensions of foods (organic, sustainable, natural, etc. – 'process claims'). Lastly, by using a picture that enables completely free interpretation because it does not verbally mention health ('health imagery'). The pictures were confirmed as more effective (than e.g. functional claims) in product evaluation concerning perceived healthfulness and purchase intention (Chrysochou and Grunert, 2014).

Seal of approval logos on food packages

Various ways in which labels display less explicit health information can be distinguished. First, some health logos on the front of a package highlight only positive facets and are labelled with a stamp fulfilling certain assessment criteria of quality (health tick, seal of approval). Steenhuis, et al. (2010) used less explicit nutrition logos on chocolate cake and confirmed that this makes the cake less unhealthy for consumer participants. However, the results cannot be generalized for all food products. Another example, emphasizing the positive side of the product, is three stars system where a higher number of stars displays better nutritional evaluation of the food product (Van Kleef and Dagevos, 2013; Fullmer et al., 1991). These types of logos inform consumers about the overall quality of products without detailed nutritional data.

Second, traffic light or multiple traffic light (TLS or MTL) systems indicate both positive and negative nutritional information on the package with three coherent colours (van Kleef and Dagevos, 2013). Nutritional data about four of the key components (sugar, salt, fat, saturated fat) are expressed by means of different colouring such as green, amber and red. Hence, if the product holds traffic light with green colour, it shows low and healthier levels of one of the key

components and vice versa (van Herpen and van Trijp, 2011; Schuldt, 2013). Guidelines daily amounts (GDA) indicate rations of main food components expressed in percentages of the daily intake of an adult of an average weight and level of activity. GDA presents amounts in grams and percentages for sugar, salt, fat, saturated fat and calories per serving, and has become very familiar in the USA, UK, France and Germany (Feunekes, 2008; van Herpen and van Trijp, 2011).

Health tick and seal of approval are portrayed in aggregated signposts and consumers can simply note it on the food package without further elaboration. However, TLS and GDA are indicators of concrete nutrients in food composition. They consist of more extended information than signpost logos, but consumers cannot see how healthy the product really is when GDA is used (van Herpen and van Trijp, 2011).

Implicit health information on food package

Health information can also be communicated by implicit messages or cues – a colour, pictures, and other suggestions that are associated with healthiness. One example where a subtle information has been used is a smoking promotion. After a controversial era of verbal health claims, cigarette advertising in the U.S. switched to the subtle way of depictions. The direct verbal messages strongly stated that smoking had positive effects on health (such as stress relaxation, better concentration, etc.). However, even visual claims had an impact on youth's perception and behaviour regarding smoking (Paek et al., 2010). More importantly, Paek et al. (2010) claim that 'vivid information is more persuasive than bland information because vivid information comes to mind more easily' (2010, p.771). Thus, when they were replacing verbal claims by colours (white, green, blue - Paek et al., 2010), visual images and human body portrayals, this enabled lower elaboration of the consumer and higher persuasion at the same time. The vivid claims or implicit graphic claims (pictures) might be, thus, more effective than the verbal ones.

Schuldt (2013) revealed that there are certain connections and bonds between green colour and healthiness. In other words, a consumer perceives the green calorie label as a healthy sign regardless of number of calories attached to the product. Although the food might be nutritionally poor, the green colour suggests a healthy content to the consumer. Moreover, there might be seen a certain analogy with traffic-light system with green colour which essentially recommends to buy the foods because of its healthy composition. Thus, there is again a particular visible connection between the implicit (colour) aspect of a package and healthy products which can positively affect perception and interpretation of nutrition labels (Schuldt, 2013).

Koenigstorfer et al. (2013) investigated that right after consumption "fitness" cues on packaged foods lower guilty feelings. Moreover, participants in the study considered themselves to be closer to a fulfilled health or fitness goal. A visual image that symbolizes health on food product packaging was shown to be a very strong and useful element in communication about health to consumers next to health and nutritional claims (Chrysochou and Grunert, 2014). Hence, some studies proved that there is not only a need to use verbal claims to forward certain message. The colours and visual imageries might have the positive effects on perception of food and consumer behaviour.

2.2 Dual systems perspective on nutritional information processing of consumers

System 1, system 2 thinking and the effect of explicitness on persuasiveness

System 1

It is now generally accepted that consumers have two systems with respect to way of thinking and processing of information (Kahneman, 2011). System 1 which is quicker and automatic, responds to a stimulus with either no effort or just a slight one. Within this system, we learn to link our ideas about objects into associations that make sense to us. Moreover, within system 1 images, perceptions and opinions are formed and, most of the time, transformed into a coherent thought. This thought is reflected into our behaviour. Different systems of thinking mean dissimilar way of processing nutritional information on the food package.

System 1 can process an implicit message, since the implicit message is expressed e.g. with a colour or picture without words, and enables a processing quite fluently, it is easier for the consumer to comprehend in the context (Kahneman, 2011). This system facilitates less demanding and faster processing of implicit message. In addition, sometimes the person processes through system 1 and heuristically without paying greater attention automatically accepts additional source of information as a valid argument. This person might be, thus, more likely to be persuaded. Better persuasion effects can also occur through avoidance of too strong recommendations or by keeping overall conclusion but rather with more neutral formulations (O´Keefe, 1997).

System 2

On the other hand, system 2 processes the stimuli rather slowly, thoroughly and is subjectively affected by one´s thoughts, selections and the extent of individual concentration. After a thorough cognitive reasoning, people have been found to be more likely to eat hedonic foods (Kahneman, 2011, p.41). Kahneman (2011) compared the exhaustion of processing the information with physical exercise as an excuse for taking something tasty after this exhaustion. Explicit messages include words and generally more information, thus, the consumer needs to spend more time and deeper elaboration on the message. This effort can exhaust him in so far as he needs to indulge himself rather than take something healthy (Kahneman, 2011).

A high degree of familiarity evokes a positive feeling and helps processing information effortlessly. When system 1 cannot identify and explain some information caught by our attention, system 2 is activated and retakes the main responsibility as a ´self-control´ (Kahneman, 2011). Hoffman et al. (2009) elaborate how self-control can be better understood. They suggest people act intentionally or based on impulses. To get people from a clear line of what they intend to do concerning the long-lasting goals, impulses springing from various situations (being drunk, being low in self-confidence) as well as genetic information may play an essential role in shaping an overall outcome behaviour (Hofmann et al., 2009).

Miller et al. (2007) clarify implicit persuasion as an indirect and explicit persuasion as a direct expression. A meaning of an explicit message seems to be clear and direct. Whereas implicit message enables usage of own independent and various interpretations leading to no direct choice as the only correct one (Miller et al., 2007). O'Keefe (1998) argues that a moment when explicitness can serve in better persuasion of an argument is dependent on a person´s dedication to elaborate on the supporting argument. O'Keefe, furthermore, claims that persuasiveness increases with direct and straightforward language as well as high quality of arguments (O'Keefe, 1997).

In essence, there is limited number of studies assessing the effects of an implicit (subtle) health messages on consumer behaviour (Wagner et al., 2014). Research of Schuldt (2013) prove a role of colour on health message and his experiment showed that green colour seems to convince people that they actually made a healthier food choice than with red colour. In line with this conclusion, research of Wagner et al. (2014) also confirms that a subtle health message offers a better way to communicate and persuade consumers to select the healthy choice. Ultimately, the subtle message is more simply processed through system 1, whereas explicit message needs to be deeply thought by system 2. It is expected that the explicit message requires more demanding processing because the consumer needs to elaborate on the written message more carefully, and it takes a greater effort than with the subtle message (colours and pictures). Also, when people have various levels of cognitive resources or they are occupied by something else, they process cues differently through either system 1 or 2. Thus, they are differently affected by the implicit or explicit message.

2.3 Potential underlying mechanisms explaining effects of different degrees of explicitness

This subchapter clarifies the key potential underlying mechanisms explaining that different level of explicitness can affect consumer behaviour (choice) – see Figure 1.

P*rocessing fluency*

The first mechanism is related to *processing fluency.* Whittlesea (1993) used a processing fluency as the subjective ease of processing of information with respect to familiar feeling of having come across the same object some time ago. Consumers evaluate products on the grounds of information they receive about the elements and an ease with which the information is processed, this can contribute to creation of favourable attitudes towards the object (Lee, Labroo 2004).

Moreover, if a cue looks easy to interpret, it can be easier to remember (Whittlesea, 1993). When logos and pictures are repetitively exposed to consumers, they are more accessible in a memory and become processed more plainly. Subsequently, logos and pictures appear to be preferred among consumers. An iterative exposure of products with their logos and pictures can increase liking and consumers like familiar and predictable cues (Lee and Labroo, 2004).

A frequent exposure could contribute to higher familiarity of health messages on food packages which might be helpful in stimulating consumers to buy healthy food products. Implicit health

message might be easier to process since it contains a picture (logo) and green colour. The processing fluency of the logo and green colour may be faster in comparison with a written sign and, thus, easier to process, remember and more favourable for consumers. However, the written word of an explicit health message might require more effort for processing, further elaboration and subsequent interpretation. Likewise, the message of explicit condition can be more difficult to remember compared to the picture.

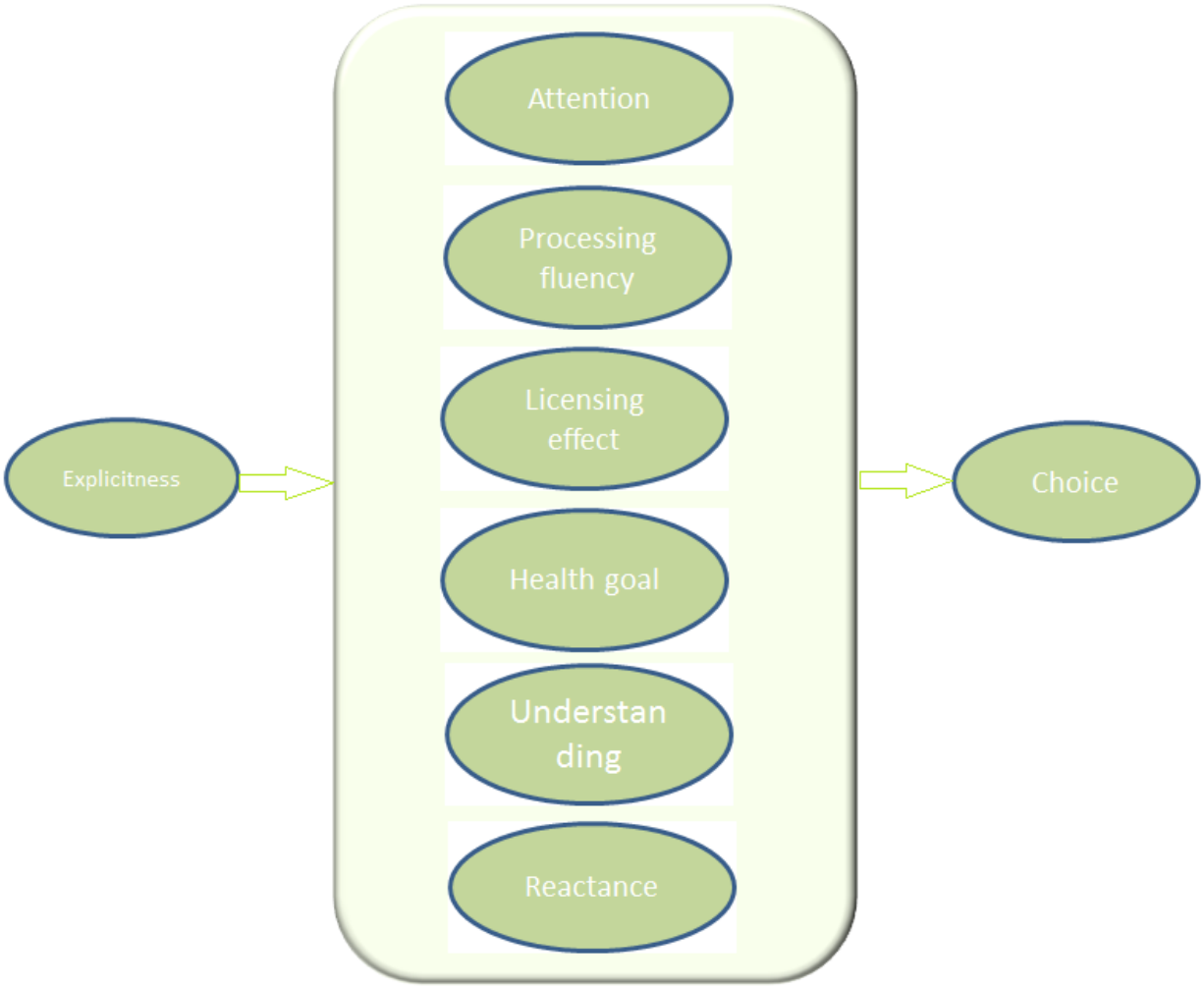

Figure 1 Key potential underlying mechanisms

Supermarket environments are full of many cues trying to attract consumers and forming their daily food choices. Therefore, in a labyrinth of the cues, each of them has to perform an extra role to be preferred by the consumer. The study of Berger and Fitzsimons (2008) on effects of other implicit cues in the environment seems to be also relevant in following matters. Not only single–shot but even frequent exposure of semantically related objects or their features can positively influence one's judgment and lead to accordant decision. An iterative exposure of conceptually and perceptually related cues enables smoother product accessibility, processing of the cues following to the choice. Hence, consumers exposed to related features for more than once can

evaluate products more positively and select them more commonly. For instance, products perceptually related to Halloween (orange colour) - were more accessible for consumers right before this holiday than a week after and, thus, purchased more often. Similarly, participants reacted fast to identify Puma sneakers brand when being exposed to conceptual primes – i.e. picture of dogs (Berger and Fitzsimons, 2008).

As a consequence, when a consumer is exposed to implicit health messages, repetitively, he might process them easier, quicker and be more familiar with the information. Subsequently, the message can even have the positive impact on one's evaluation, and actual behaviour. In addition, there are other options beside colours or pictures such as slogans, product headings, and all kinds of messages useful in leading one's ease of processing, evaluation and purchase likelihood (Berger and Fitzsimons, 2008). For instance, familiarity of the labels helps find consumer´s way around labels and make their healthy choice much faster (Bialkova and van Trijp, 2010).

Health goal activation

Another factor influencing behaviour and consumption of a consumer may be health *goal activation.* Shah and Kruglanski (2003) state that one's goals can be primed through their usual way of achieving. A thought of how to achieve a goal can lead like priming stimuli to the goal having in mind. Furthermore, one can accumulate several ideas to achieve a particular goal. For instance, having a fridge full of fruits and vegetables may be an effective priming stimulus to follow healthy eating. Belei et al. (2012) suggest that food products with hedonic attributes bearing low-fat health claims on a 'chocolate product package' may activate a health goal at a lower degree compared to antioxidant health claims on 'cocoa beans' with functional attributes (Belei et al., 2012).

Finkelstein and Fishbach (2010) state that consumers experience a conflict when they want to consume healthy food and take something tasty at the same time. When consumers are exposed to health claims, the health goal is either activated (more typical for people concerned about their own weight) or inhibited (less concerned about own weight). However, sometimes consumers fulfil their health goal and they would like to indulge themselves afterwards. Furthermore, less concerned people barely follow health claims in comparison to more concerned consumers. Symbolic messages might be a sufficient instrument in one's choice even if some other consumer has negative feelings about them (Finkelstein and Fishbach, 2010).

Packaging is another influencer of health goal activation. Silayoi and Speece (2007) point out that packaging is a marketing tool that is very meaningful with respect to the communication with the consumer. Packaging is an important instrument that can be used to influence the decision-making process of the consumer. Moreover, there are several elements that underlie appropriate communication in relation to consumers such as pictures, colours and information. An example of the latter is food labelling which can generally help consumers in making healthier choices through awareness of other alternatives at disposal. Nutrition labelling is such a powerful mean, since crisps with attached low-fat logo are believed to be less unhealthy (Geyskens et al., 2007), these

claims on product packages can lead to overconsumption (Wansink, Chandon, 2006; Koenigstorfer et al., 2013).

Moreover, subtle messages or even other product cues (e.g. green colour) may stimulate health goals or change consumers' health perception since the colour itself embraces a particular dose of symbolical sentiment which leads to a concrete psychological outcome. Though, one cannot be sure whether the green calories label has the main impact on purchase and consumption. More importantly, even if healthy eaters are exposed to the number of calories and they perceive that the food is of lower amount of nutrition, they might be more persuaded by this green calories label (Schuldt, 2013).

Overall, explicit health claims can lead to health goal stimulation because the consumer faces to a direct message about the healthiness of the food. The message consists of straightforward and clear information that can be quite helpful and less confusing in finding the healthy choice. Whereas a subtle claim can provide the consumer with greater space for acceptance of the message but it can also take more time to realize what the message should imply to the consumer. The implicit claim may, however, suggest consumers that there is a healthy choice and the goal stimulation may be less obtrusive. Hence, implicit health message on food can be more powerful in health goal activation.

Explicit messages may lead to licensing effects

The next type of psychological mechanism may also play a role: the *licensing effect*. Khan and Dhar (2006) studied licensing effects and showed that the last food choice is influenced by the previous one (e.g. Firstly, I chose healthy food and now I can indulge myself). Primarily, people select an object that seems 'virtuous' to them. The licensing effect makes people feel free to buy something indulgent eventually (Finkelstein and Fishbach, 2010*)*. Interestingly, licensing effect might be illustrated on the study where endorsing of Afro-American president candidate could license voters to support Whites to the prejudice of Blacks (Effron et al., 2009).

This licensing effect may also play a role in food choices. Consumers can buy something utilitarian meaning 'healthy' that serves as a necessary food and consequently they can reward themselves with a hedonic choice. By making product explicitly healthy consumers might have the idea that their health goal is already 'fulfilled', leading to more indulgent choices (Wilcox, Vallen, et al. 2009). Wilcox et al. (2009) explain the principle of licensing effect in this way. If a consumer does not stay on a healthy diet and takes something tasty instead, the consumer more likely will choose the unhealthiest offering which is at disposal. Furthermore, we have two types of choice sets. The first one consists of healthy and unhealthy food options. The second choice set includes only the unhealthy foods. The former can lead consumers to select the unhealthy option. In relation to the choice set, the more the consumer wants to achieve personally relevant long-term healthy goals; he rather selects the indulgent option compared to other consumers for whom the health is not that important (Wilcox, Vallen, et al. 2009). Hence, we can suggest that explicit health message as a direct information may lead to avoidance of the healthy food and more likely to licensing effects. On the other hand, implicit health message might help in a subtle implication that the food

product is healthy and more positively accepted by the consumer and chosen rather than something unhealthy.

Reactance to being steered into certain choice

Rains and Turner (2007) used a definition of *reactance* as a psychological state of motivation directed towards the restoration of eliminated or threatened freedom. Miller et al. (2007) defined reactance as a 'psychological state' that can occur as a result of particular situation. Reactance varies with different people, their characteristics and is mostly stable within a period of one's life. Furthermore, they explained that the degree to which a person experiences reactance differs based upon his awareness of the freedom to pursue certain behaviour, own self-perceived ability to be engaged in a freedom and, lastly, the fact that the person can deserve this concrete freedom (Miller et al., 2007).

Utilizing of a very explicitly healthy message can give people the feeling as if they have no free choice. People do not like to be pushed in to a certain direction and, as a result, react by doing the opposite. Moreover, the probability of reactance behaviour increases as one loses his alternative choice and, thus, a different option turns out not to be available. Subsequently, the consumer may react to threatened or eliminated freedoms (Clee and Wicklund, 1980). When one states a strong argument and specifies a concrete conclusion, it might decrease the persuasion because it simply extends the ´disagreement space´ and raises the reactance. This statement also implies that the possible use of less explicit messages might be more persuasive by including a receiver to take part in forming of the overall conclusion (O'Keefe, 1997).

Explicit messages asserting that a particular choice is healthy and, thus, logically better for the consumer, do not indicate any other correct option which may lead to reactance behaviour. Whereas a subtle message may give consumers the chance to make their own choice preventing the consumer to feel despoiled of his freedom of the choice. Based on the reactance theory we would expect more explicit messages to increase reactance behaviour of consumers. Therefore, we assume implicit health message might be more efficient in leading the consumer to the healthy choice because the message may decrease reactance behaviour, open the space for own interpretation of the message and better acceptance by the consumer.

Explicit messages draw more attention

Attention is another essential mechanism influenced by different degree of explicitness. Explicitness contributes to a larger degree of attention and is perceived as more relevant as well as credible which more likely leads to persuasion by certain message (Miller et al., 2007). Making healthy choices more explicitly healthy can make it easier for consumers to identify healthy products (Bialkova, van Trijp, 2010; van Herpen, van Trijp 2011).

Consumer´s attention is predetermined by top-down as well as bottom-up processes. The top-down process relates to the capacity of the viewer, his goals and the time pressure that pushes him to pay attention through a certain level of own concern. Whereas a bottom-up process is affected by the label, its design and place on the package which becomes essential with respect to

grasping the attention of the consumer. Van Herpen and van Trijp coincided with the idea that consumers pay more distinctive attention to nutrition data, only if they intend to buy healthy foods (van Herpen, van Trijp 2011).

Apart from many cues (e.g. products and different brands) that the consumer is exposed to during shopping of groceries, there are a few elements which are essential in drawing attention and may steer consumers into the purchase decision. Bialkova and van Trijp (2010) showed that attention is mainly paid to double sized lettering and unicolor rather than multicolour labels. Contrariwise, some groups of consumers comprehend as well as prefer colour-differentiated (traffic-light system) to unicolour labels. Thus, this indicates that various colour labels reflect various deliberations (Bialkova, van Trijp, 2010).

According to van Herpen and van Trijp (2011), the attention to nutritional labels is depending on consumers' goals and resource limitations. If the consumer is led by his own healthy need, it can ordain the attention and the extent of his elaboration. Moreover, attention can be affected by lack of time and there are nutrition labels which suffer from time constraints (nutrition tables), because consumers simply do not elaborate on them thoroughly within the purchase moment. However, certain labels (logos and MTL) still resist this pressure and despite time constraints, can be very helpful for consumers to follow the nutritional information notified on the package (van Herpen and van Trijp, 2011). For better effect of the attention, the nutrition logos should be placed on a steady spot on the package (Bialkova and van Trijp, 2010).

Based on these assumptions, we suppose explicit health message may be easier to catch attention and more understandable for consumers. On the other hand, implicit health message may draw less attention and can be understood differently or vaguely. However, the choice of healthy foods might be still dependent on how the consumer concerns mainly about his diet, healthy life style or time constraints during the moment of choice.

The more explicit, the easier to understand

We assume explicit messages may be easier to understand since the information is clearly and verbally stated. A consumer knows what he can expect. Whereas implicit messages may be too vague or ambiguous and the consumer might get confused. Hence, the more explicit the health message, the better understanding for the consumer which may lead rather to healthy food choice. Consumer´s understanding of front-of-pack labelling has crucial role in the sense of proper comprehension of the information attached on the package which can thereafter lead to certain evaluation and actual choice.

On the other hand, studies proved that not so much information is often elaborated while purchasing (van Herpen and van Trijp, 2011). Generally, literacy and appropriate numeracy predetermine understanding which leads to an adequate interpretation and subsequent food choice (Rothman et al., 2006; Fullmer et al., 1991). Moreover, good understanding can be enhanced by careful attention while reading the message on food labels. Consumers should be,

thus, educated in order to comprehend the food labels on a satisfactory level, avoid overconsumption and follow healthy lifestyle (Rothman et al., 2006).

Understanding is a part of the whole information processing procedure where the information should be stored and appropriately explained on each step (van Trijp, 2009). As a result, understanding can be predetermined by nutritional knowledge of the consumer, ability and enough time to process it. Since many consumers in general possess quite narrow knowledge, they prefer simple, understandable and credible information to avoid a redundant confusion (van Trijp, 2009; Hasler, 2008). For this purpose, EU legislation on nutritional and health claims requires comprehensible claims on foods, so that they can make sure an average consumer understands the meaning (Leathwood et al., 2007).

Grunert et al. (2010) investigated understanding of GDA labels in different European countries. Some countries showed better understanding (UK, Sweden, and Germany) than others (Hungary, Poland, and France). Generally, there are several factors characteristic for each of the countries (age, social grade, public discussion about nutrition labelling system) that steer understanding of the nutrition information and healthy eating. In addition, not only understanding, but also motivation does play a very important role in attention to labels. Grunert et al. (2010), however, did not further investigate if nutrition labels directly contribute to an increase in healthy food choices.

2.4 Summary and hypothesis

Summary

This study focuses on the difference between the effects of explicit and implicit (subtle) health messages on food choice. Essentially, there is very limited research conducted in this field about effects of implicit health messages on consumer behaviour (Wagner et al., 2014). We similarly to Wagner et al. (2014) manipulated the explicitness of health information on a food package, but also added another implicit health message (e.g. green background colour of food package). This led to a between-subjects design with four conditions used in a field experiment: (1) explicit health information, i.e. ´This is healthy choice', (2) moderately implicit health information, i.e. 'seal of approval´, (3) extremely implicit health information, i.e. green colour on package, (4) control condition with no health information.

We aimed to investigate whether explicit or implicit health messages should be chosen in communicating with consumers in order to guide healthier food choice of consumers. We expected that a subtle health message would be more effective because it is easier to process, to remember, it may be accepted more positively due to a minimal obtrusiveness and consumers may have a space for own interpretation.

An explicit piece of information may be more likely to be processed consciously which takes an effort. Moreover, when a health message is a picture, it can be easily processed, remembered, recalled. However, when words are used, it requires more effort to process the information. Additionally, the straightforwardness of an explicit health message may decrease health goal activation and lead to licensing effects. The explicit message draws greater attention than the implicit one, thus, it can help consumers in sufficient level of their understanding of food health claims, and clarification of which food product is healthy. However, the explicit health message can lead to certain reactance behaviour as there is less space for own interpretation (Clee and Wicklund, 1980) and lower taste expectations (Wansink et al., 2004). Below, we formulate our hypothesis and describe the methodology (a field experiment) we use in order to get the results for our hypothesis.

Hypothesis

A subtle health message (i.e. logo or green colour) on a healthy cookie is more likely to lead towards a healthy choice than an explicit health message (i.e. slogan 'this is healthy') or no health message.

3 Methodology

For our research, a field experiment was done to test how consumers respond to health messages on food labels. A pilot study was conducted to guide the selection of foods used in the main field study.

3.1 Pilot study

A pilot study was conducted to determine what products could best be used in the field experiment. We used pictures of 5 product combinations of 2 different snacks (see Appendix 1). In each product combination one snack constituted a healthy choice and one constituted a less healthy choice to find out what products will be most appropriate in the field experiment. The choices were arranged as follows: a) slice of "ontbijtkoek" or slice of cake, b) regular cookies or chocolate cookies, c) oven baked paprika crisps or regular paprika crisps, d) muesli roll or croissant, and e) dried fruit or candy (drop). Moreover, pictures of healthy choices within all 5 product combinations were presented each time in columns. These columns were randomly placed either on the left or on the right side of the questionnaires. By the arrangement it was intended to investigate and possibly prove whether participants choose, for instance, healthier product on the right side.

Hardcopy and online versions of a brief questionnaire were distributed. In the pilot study, 98 participants (60% female, 40% male, mean age = 27) were asked, if offered a free food product, to choose one product from each of the five pairs. Hardcopy questionnaires were randomly distributed at Orion building, Technotron, Axis, and at Dijkgraaf dormitory to 60 students and staff of Wageningen UR. The link to the online questionnaire was posted on social network Twitter and completed by 38 respondents. Table 1 indicates the percentage of participants that picked healthy choice from each product set. The results suggest that oven baked crisps and dried fruits appeared to be more frequently chosen rather than their less healthy counterparts.

Table 1 Percentage of participants who chose healthy snack

Healthy snack	Choice (%)
slice of "ontbijtkoek"	44
regular cookies	24
oven baked paprika crisps	69
muesli roll	40
dried fruit	62

The results show that the choice for the healthy regular cookie (24%) was chosen less frequently than the less healthy chocolate cookie (76%). However, the choice was not very different for men, women, and nationality. There was no influence of gender ($\chi (1)^2 = 0.02$, $p= 0.90$), nationality (χ

$(1)^2$ = 1.33, p = 0.25) and no statistically significant difference whether the chocolate cookies, regular cookies, respectively were offered on the left or on the right side of both hardcopy and online questionnaires (χ $(1)^2$ = 0.49, p= 0.48). Overall, we chose a combination of regular cookies and chocolate cookies as the most appropriate snack for further field experiment. Lastly, another reason why cookies were selected as the most suitable snack for the experiment is that they are appropriate and convenient for the event, as they are portable and easy to supply.

3.2 Main field experiment

3.2.1 Design

In the main study, participants had to make a real choice between a relatively healthy and unhealthy cookie. A research (assistant) holding a tray approached potential participants and asked them whether they wanted to have a cookie and fill in a brief questionnaire (see Appendix 2).

Participants were assigned to one of four conditions in a between subjects experimental design. Each condition varied the way in which the healthiness of the regular cookies was communicated at the food label. All four conditions are shown in Figure 2. The study used health messages only for the healthy cookies.

Figure 2 Four types of health messages used on cards of regular cookies

Four conditions of health messages which differed in the explicitness of health messages were employed: 'This is healthy!' (explicit condition), 'seal of approval logo' (logo condition), 'green

colour' (implicit condition) and 'control condition' without any message. Participants chose between two options of a snack (one healthy in itself – regular cookie with fibre for better digestion and one less healthy – chocolate cookie). In Figure 3 we used the explicit health message on the left side and chocolate cookies always with no message on the right side.

Figure 3 A tray with explicit health message on regular cookies (left) and chocolate cookies (right) without any health message

3.2.2 Participants

In total, we reached 417 participants (mean age = 34, 79% Dutch, 21% other nationality, 53% participants were female) at sports event WE-day in Wageningen and at Leeuwenborch. Across the four conditions 102 participants were exposed to the explicit health message sign, 98 participants to seal of approval logo, 105 to implicit health information (green colour) and 112 participants were exposed to the control sign.

3.2.2 Procedure

In June 2014, WUR employees gathered at WE- day in Wageningen. WE-day is an annual sports event at Sports Centre de Bongerd in Wageningen, where university staff is welcome to take part in several sports disciplines. People on playing fields as well as attendees relaxing before and after some sports disciplines were approached to take part in the study.

Three teams of two people were cruising around the attendees and asked if they would like to take a cookie for free. The attendees could choose between healthy (regular) cookie and less healthy (chocolate) cookie.

Regular and chocolate cookies were placed on unicoloured wooden trays in equal amounts. Cookies were packaged in small see-through plastic bags and a label was attached to the transparent package. Depending on the condition, healthy cookies were labelled 'This is healthy!' (in the explicit condition), 'seal of approval logo' (logo condition), 'green colour' (implicit condition), or 'control condition'. Seal of approval logo introduced as a 'health tick' is commonly used as healthy indicator in the Netherlands. In the green condition we used green colour without words and pictures. Control condition did not hold any words or pictures, only white colour was used. In all conditions there was a sign 'for you' on the cards (see also Figure 3).

Chocolate cookies were always situated next to regular cookies and each time on the same side of the tray. Thus, the only cookies that were changed during the field experiment were regular cookies with four conditions of health messages. In all conditions the chocolate cookies were labelled similar to the control condition and in the same amount as the regular cookies. The experimenter regularly refilled the tray.

Participants could freely choose one cookie from the wooden tray. The type (either regular or chocolate) of cookie selected was registered (see Appendix 3). After they made the choice, the participants were asked to fill out a brief questionnaire.

After more or less 10 participants the teams unobtrusively switched into another condition by changing healthy cookies and their health messages (explicit, logo, green colour, and control condition) in spots around sports area. Since the number of respondents after WE-day event was not sufficient, students and Wageningen University staff were approached by one person at Leeuwenborch another day. The communication with participants, questionnaires and unobtrusive changing of all four conditions remained the same. Data collection was completed in two days.

3.2.3 Measures

The key dependent measure in this field study was the type of cookie (chocolate or regular) chosen by the participant. The researcher unobtrusively noted the option chosen by the participant.

The brief questionnaire consisted of three questions. The questions were stated as follows: a) How intense was the exercise you performed today or expect to perform today?; b) How hungry are you at this moment?; c) How important is health for you today?. The answers were measured on a Likert scale (1= not at all intense, 7 = very intense; 1= not at all hungry, 7= very hungry; 1=not at all important, 7= very important). Next, participants were asked to indicate whether they picked chocolate cookies or regular cookies. They were also asked to provide their age and gender and indicate whether they are Dutch (answer possibilities: yes or no).

3.2.4 Data analysis

First, it was checked whether randomisation across conditions was successful. A chi-square analysis was performed to check whether there were significant differences between the four conditions in gender and nationality. Separate ANOVAs were done to find out whether there were

differences across conditions in intensity of exercise, feelings of hunger, and the importance of health.

As data was collected in two different contexts (WE-day versus work situation in Leeuwenborch building) we also checked whether these two samples differed in intensity of exercise, feelings of hunger, and the importance of health, gender, age and nationality. More importantly, a chi-square analysis and logistic regression were used to test the hypothesized effects.

4 Results

In our study, we tested our hypothesis in order to provide an answer for the main research question, whether explicit or implicit (subtle) health messages are more effective in guiding consumers to make healthier food choice. The results part is divided into four sections. The first two sections present results for checks of randomisation or differences between the two samples (hunger, sports performance, importance of healthy eating, gender, nationality, age). In order to test our hypothesis, we looked at a percentage of participants who chose healthy cookie, the effect of explicitness of health messages on choice using a chi square analysis and also logistic regression.

Randomisation checks

By means of the randomisation check we examined whether randomisation of participants across conditions was successful. A chi square test showed a significant difference in the distribution of nationality between the conditions ($\chi (3)^2 = 15.08$, p=0.002). The percentage of non-Dutch was significantly different across the different conditions. The percentage of control condition was 33% for non-Dutch, the percentage of green colour was 19% for non-Dutch, logo condition was represented by 21% of non-Dutch and lastly, only 12% of every other nationality was embodied in explicit health message. However, the same test showed non-significance ($\chi (3)^2 = 4.29$, p=0.23) in the distribution of gender across the conditions. Through ANOVA we found out, there was a marginal significant difference across the four conditions in how hungry (for control condition M=3.7; for green colour M=3.4, for logo M=3.6, for explicit condition M=3.1) participants were ($F(3,416) = 2.17$, $p = 0.09$). Moreover, there were no significant differences across conditions in how intense participants exercised ($F(3,415) = 1.96$, $p = 0.12$); and how they perceived importance of health at that moment ($F(3,416) = 1.13$, $p = 0.34$). Nationality and level of hunger will be controlled for in the logistic regression.

Comparison of sample consisting of WE-day participants and sample of WU staff and students

The two samples of participants did not differ in their level of hunger ($F(1, 416) = 1.45$, $p = 0.23$) and their perception of importance of health ($F(1, 416) = 0.22$, $p = 0.64$). Also, a chi square test showed that the distribution of gender across samples was not statically different during data collection at sports event and at Leeuwenborch ($\chi (1)^2 = 0.84$, $p = 0.36$). On the other hand, a significant difference was found between participants who did and who did not attend the sports event, in their intensity of physical exercise ($F(1, 415) = 6.66$, $p = 0.01$). Mean value for sports attendees was higher (M=4) than for those who did not attend the sports event (M=3.5). Furthermore, also significant differences were found between the two samples in the percentage of non-Dutch ($\chi^2 (1) = 7.49$, $p < 0.01$) and age ($F(1, 416) = 78.45$, $p< 0.001$). The percentage of people with a non-Dutch nationality was lower (18%) in the sports day sample than in the sample of staff and students at Leeuwenborch (29%). Participants who joined the sports event had a significantly higher age (M= 38) than the people who did not join the event (M=27).

Descriptives

First, Table 2 indicates correlations between the three questions, their mean value and standard deviation. Table 2 shows significant correlations between intensity of physical exercises and how hungry were participants at that moment ($p<0.01$) and importance of healthy eating and age of the participants ($p<0.01$). These correlations suggest that participants who had higher level of physical exercise were hungrier ($r=0.25$) and that the importance of healthy eating is positively related to age ($r=0.13$).

Table 2 Means, Standard Deviations and correlations between the variables in the study (N= 417)

	Intensity of exercise performed today	Hungry at this moment	Importance of healthy eating today	age
Intensity of exercise performed today				
Hungry at this moment	0.25**			
Importance of healthy eating today	0.06	-0.01		
age	0.33	-0.02	0.13**	
means	3.9	3.5	5.0	34.6
SD	1.9	1.7	1.5	12.8

**p < 0.01

Choice of regular cookie

Overall, across all conditions 36% of participants chose regular cookies. A chi square test showed no statistical association between the type of the message (condition) and choice ($\chi (3)^2 = 0.06$, $p = 0.99$). Figure 4 indicates how each condition was represented for healthy choice. The results from Figure 4 imply that choices of regular cookies are below 40 %. The percentage of participants choosing the regular cookie did not change much, even though different health messages were used.

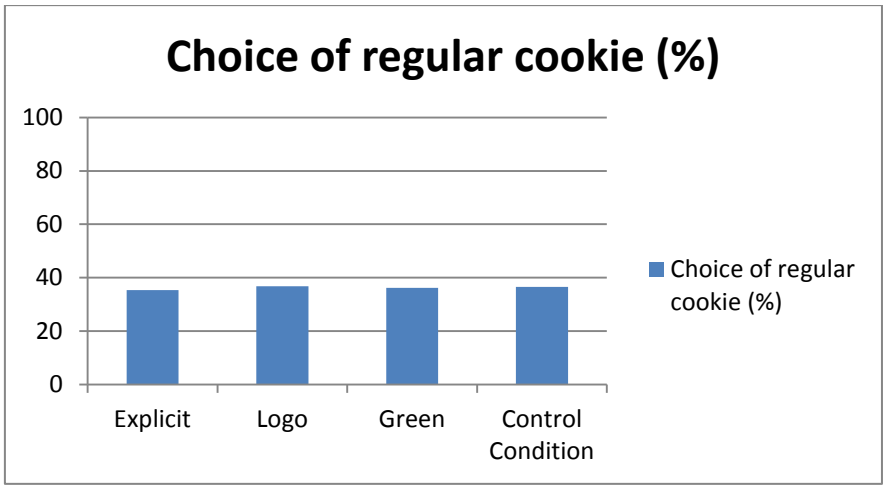

Figure 4 Percentage of overall choice of regular cookie within four health messages (conditions)

Predicting of healthy choice

A logistic regression was conducted to further examine how other predictors (age, gender, physical exercise, etc.) could predict choice. The conditions were dummy coded with the control condition serving as the referent condition; the effect of each condition was compared to the control condition. First, we looked at a measure of goodness of fit (likelihood ratio) which was 538.25 without predictors. When we added other predictors (hunger, importance of health, physical exercise, age, gender, and nationality) we saw how the goodness of fit changed. The goodness of fit decreased to 531.23 and, overall, it indicates the model is not very good. The model with the predictors showed Nagelkerke R Square found firstly 0.022, then 0.045 amount of variance explained. In other words, this indicates that only 2.2% and 4.5% of the variance is explained by the model. This percentage is very low. Hence, this model is rather poor for predicting the choice. Omnibus test of model coefficients provided non – significant results before ($p = 0.34$) and after adding the predictors ($p = 0.13$).

First, the results showed no effect of any of the health message conditions on choice. Second, the results of the logistic regression indicated age as a significant contributor to the choice (Wald (1) =5.59, p=0.02). This indicates that a probability of choosing a healthy cookie over an unhealthy cookie increases with the age of the participant Exp(B)=1.02 Furthermore, the results showed that the importance of health had a marginally significant impact on choice (Wald (1) =3.59, p=0.06). Participants who find health more important were more likely to choose a healthy cookie over an unhealthy cookie (Exp(B)=1.14). Hence, only these variables such as age and importance of health had a significant and marginally significant effect on the choice. Nevertheless, there was no significant effect of the manipulated explicitness of health messages on choice.

Table 3 Results of logistic regression: conditions, intensity of exercise, hunger, importance of health, age, gender and nationality (The dependent variable (DV) as a binary response variable, with 1 indicating the choice for a healthy cookie and 0 indicating the choice for an unhealthy cookie)

	B	S.E.	Wald	df	Sig.	Exp(B)
Intensity of exercise performed today	0.003	0.57	0.004	1	0.95	1
Hungry at this moment	-0.08	0.06	1.52	1	0.22	0.93
Importance of healthy eating today	0.13	0.07	3.59	1	0.058	1.14
Condition (control condition)			0.32	3	0.96	
Condition (green colour)	0.10	0.30	0.12	1	0.73	1.11
Condition (logo)	-0.05	0.29	0.03	1	0.86	0.95
Condition (explicit message)	-0.03	0.30	0.007	1	0.93	0.98
age	0.02	0.01	5.59	1	0.018	1.02
gender	0.17	0.21	0.63	1	0.43	1.18
nationality	-0.29	0.26	1.30	1	0.25	0.74
Constant	-1.54	0.57	7.35	1	0.007	0.22

5 General discussion

The present field study examined the effects of the explicitness of health messages on food labels on food choice. We manipulated the label of a relatively healthy cookie by displaying a health message that varied in the degree of explicitness. In particular, we expected that a subtle health message (showing a choices logo or green colour) is more likely to lead to a healthy choice than an explicit health message (label stating 'This is healthy') or no health message. However, our findings did not support the hypothesis. There was no effect of the label on the choices that participants made. The majority of participants (about 60%) preferred the chocolate cookies and their choice was not affected by the way the healthiness was communicated.

Our results are in contrast with the results of the study of Wagner et al. (2014). They also varied the way in which the healthiness of a relatively healthy snack was communicated by displaying either an explicit statement that the food was healthy, an implicit suggestions using an image and a control label without any health information. In their two studies, they showed that consumers registering for a conference were more likely to select a healthy choice (apples and carrots) in case of the subtle health message.

We can only speculate why our results are different to the results of Wagner et al. (2014). Perhaps different manipulations – pictures led to stronger response than a logo and colour – might be one of the reasons that we happened to have distinct results from Wagner et al. (2014). As an implicit health message, Wagner et al. (2014) had the logo of 'red heart with a white check mark on it', while we indicated the subtle health message through a seal of approval logo (a health tick used in the Netherlands) and green colour as even more implicit health message. Thus, it is supposable that our implicit messages may have been less effective and did not persuade participants enough for their healthy choice because they might not feel persuaded enough by the implicit health message to pick the healthy choice.

In addition, there was also a difference between how Wagner et al. (2014) and we approached the participants. Wagner et al. (2014) enabled participants to 'help themselves from each basket' (p. 2) with the foods, which indicates that the conference attendees could choose whatever they wanted. The conference participants could pick random foods; they had even more than one choice. Whereas, we asked participants to make a choice between either regular or chocolate cookie, i.e. either healthy or unhealthy foods. However, Wagner et al. (2014) left the choice open, so that participants could select more than one option. This might have influenced the consumer's choice and they might feel free which could have steered them towards a healthy choice. Furthermore, in our study social influences might play a role as well. The participants were making their choices very often together with their friends. However, it is hard to say if this had an impact on choice. While they were picking the cookie they probably did not need to make a good impression at the other person which could also have the influence on choice.

Moreover, the context in which our data was collected also differed from the study by Wagner et al. (2014). Their sample had to wait at the registration booths which could lead participants to

process health messages for longer time and, thus, to different choices. However, our participants had to choose a cookie right after they were approached. Hence, they did not have as much time to process the information on the health messages as the participants in the other study.

A possible cause that might limit our research could have been an inappropriately chosen snack (cookies). We reported a low percentage of choice of regular cookie in a pilot study. Thus, influencing the choice in our field experiment might have been difficult because the cookies were not very popular from the start. First, the cookies might have been very unpopular. There appeared to be a big difference between the choice of the regular cookies in the pre-test (24%) and in the field experiment (around 40%). But they were reasonably popular in the field experiment (40%). One of the reasons of the cookies' lack of unpopularity might have been, first, the evidence that they were chosen only by 24 % of the participants in the pilot study. Second, they looked unattractive because they were melting in the field experiment. Nevertheless, the cookies were overall chosen much more in the field experiment than in the pilot test. Maybe because in the pilot study, some of the participants had in mind only the less healthy snacks or the participants in both studies simply did not perceive the regular cookies were healthier than the chocolate cookies.

In addition, the participants might not perceive the regular cookie and chocolate cookie as different from each other regarding the healthiness. Hence, the attendees at sports event and the other sample at Leeuwenborch might pick the chocolate cookie also because they were not convinced that the chocolate cookie was less healthy than the regular one. Ultimately, a different food option could be more in place. Moreover, consumers might have positive attitudes and perceptions towards health messages in general. However, they can choose and consume something unhealthy eventually. Although, the consumer might perceive the food product as healthy and the consumer could be aware of the fact he should follow a healthy diet. As a result, the actual choice and consumption may be inverse, i.e. unhealthy.

Additionally, there are other factors that shape the consumer's choice. Taste is a very important determinant of choice. Consumers' taste expectations usually precede healthiness. Wills (2012) shows that health claims on products might impair the product itself, because they can lower one's taste expectations (Wansinck et al., 2004). On the other hand, consumers sometimes prefer healthy foodstuff to less healthy and tasty snack due to their main concern of having a healthy lifestyle. Perhaps, the taste was a very important factor in this study, more than the health.

Since only few studies have examined the effects of health messages on actual behaviour, especially in real life settings (Wagner et al., 2014), our findings can be used for further theoretical research. Moreover, new studies may also reveal how exactly a black box of underlying mechanisms (attention, process fluency, health goal activation, etc.) affect the choice and elaborate on individual mechanisms and their impact on choice. Future research, thus, could try to explain what are these factors influencing healthy choice and manipulate, for instance, some healthy fruit or vegetable drinks. Our research can be useful for marketers and a development of their marketing strategy in terms of information on a packaging. For marketers, it is very important to attract consumers' attention. The health messages and their use have a huge

potential regarding the differentiation of how explicit the health claim should best be addressed to the consumer and persuade him to buy the healthiest option of a food product. Consumers like labels that are easy to understand (Hodgkins et al., 2012), future research can focus more on subtle health messages and their influence on the choice and purchase behaviour.

How to educate people

Whether or not a subtle or explicit message is useful depends also on a context of the message used on products or in campaigns, etc. However, the message aiming towards particular public should not be described as the public would feel threatened of losing of a freedom (Rains, Turner, 2007). They could experience a certain reactance by lacking of the freedom to decide on their own (Clee and Wicklund, 1980).

The effectiveness of explicitness may differ in terms of the purpose of the message. The message can be different for alerting audience against smoking risks and diseases (Hammond et al., 2004) and differ from the effects in the area of healthy eating. Grunert et al. (2010) suggest that if the message can be more effective, consumers need to be aware of health related messages from personal experiences, experiences of peers, education and promotional system, legislation framework, health and government authorities or manufacturers. These elements conduce to a better motivation, change in lifestyle and health prevention behaviour. Interestingly, the change of behaviour could more likely be accomplished if the health related information was enhanced by acknowledged and respected familiar authority such as sportsman, credible celebrity and so forth (Bhaskaran, Hardley, 2002).

In any case, our study suggests that health messages might have a very limited effect on consumers' choice, especially in real life settings. Perhaps, when these messages do not affect the choice that much, there should be other ways how to promote healthy eating habits and healthy food products. One of them could start with general health education in primary schools. Because the sooner the education of small children starts, the better the impact might have on them. Although, governments probably cannot push forcibly the parents to give their kids some basic knowledge about healthy eating. Still, the influence could be quite essential and might help in healthy habits of their children.

Moreover, social participation and a sound voice of non-governmental organisation might be used as a powerful tool as well because, most probably, both top-down and bottom up initiative could help to cope with health and eating issues prevention. Nutbeam (2000) offers a concept of 'health literacy' embracing all the elements which can educate and communicate health and, thus, contribute to a complex promoting of an awareness of health and prevention of certain illnesses.

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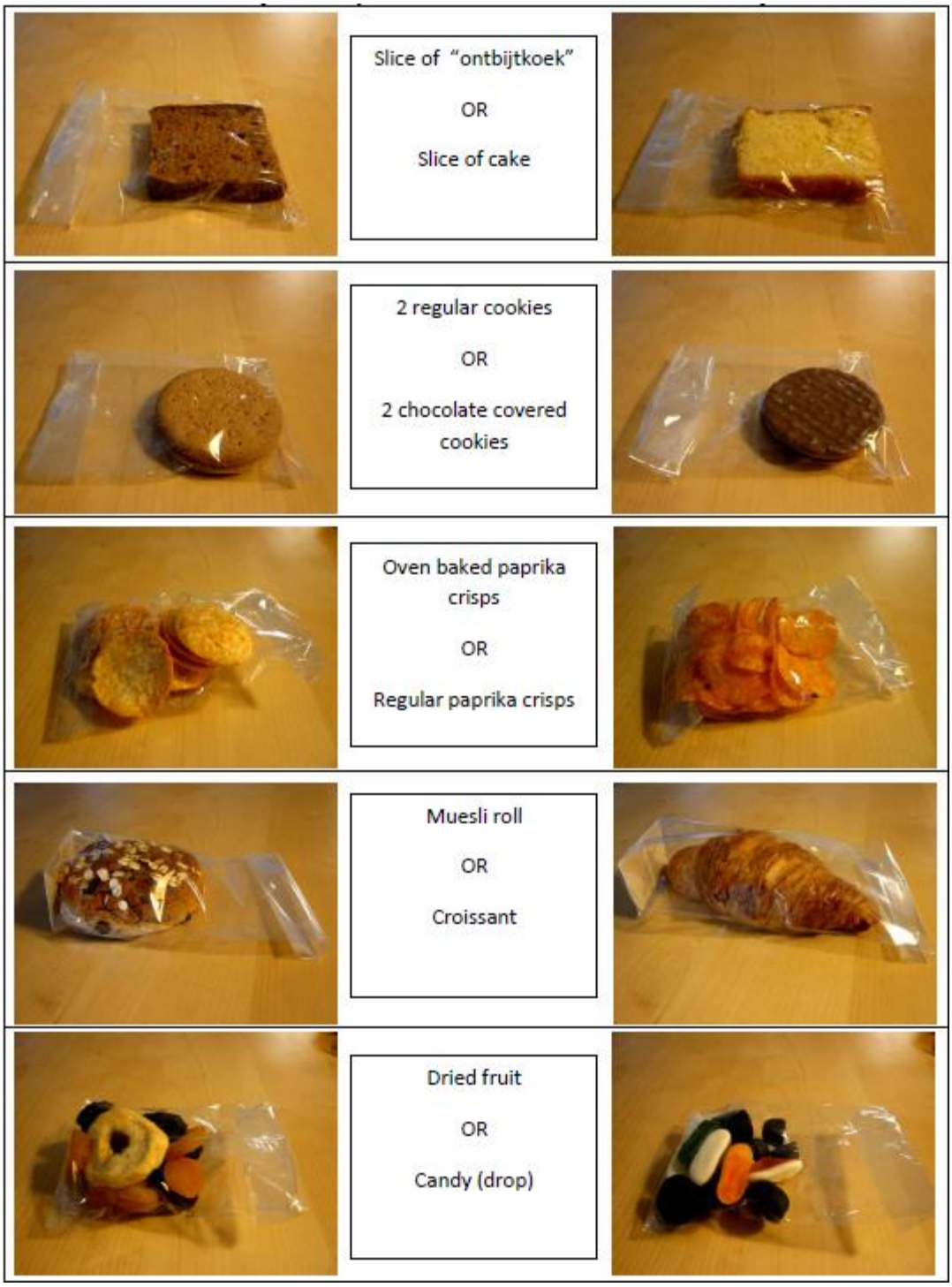
Appendix 1: a product combination of a snack in a pilot study – healthy snacks the on left side and on the right side



	Slice of cake OR Slice of "ontbijtkoek"	
	2 chocolate covered cookies OR 2 regular cookies	
	Regular paprika crisps OR Oven baked paprika crisps	
	Croissant OR Muesli roll	
	Candy (drop) OR Dried fruit	

Appendix 2: a questionnaire from a field experiment

Questionnaire WE-day

Nr:

Ex / Lo / Gr / Co

1. How intense was the exercise you performed today or expect to perform today?

Not at all intense	1	2	3	4	5	6	7	Very intense

2. How hungry are you at this moment?

Not at all hungry	1	2	3	4	5	6	7	Very hungry

3. How important is healthy eating for you today?

Not at all important	1	2	3	4	5	6	7	Very important

4. What type of cookies did you choose?
   - O Chocolate cookies
   - O Plain cookies
5. What is your gender?
   - O Male
   - O Female
6. What is your age? ..... years
7. Are you Dutch?
   - O Yes
   - O No

This questionnaire is part of the thesis of Karolina Bohacova and is for academic purposes only. Your answers will remain anonymous. If you have any questions or remarks you can contact evelien.vandeveer@wur.nl

THANK YOU!!

Appendix 3: a registration of choices of cookies

Card on plain cookie	Part nr	Condition	Choice (circle)	Comments
	1	Ex	Choc / plain	
	2	Ex	Choc / plain	
	3	Ex	Choc / plain	
	4	Ex	Choc / plain	
	5	Ex	Choc / plain	
	6	Ex	Choc / plain	
	7	Ex	Choc / plain	
	8	Ex	Choc / plain	
	9	Ex	Choc / plain	
	10	Ex	Choc / plain	
	11	Lo	Choc / plain	
	12	Lo	Choc / plain	
	13	Lo	Choc / plain	
	14	Lo	Choc / plain	
	15	Lo	Choc / plain	
	16	Lo	Choc / plain	
	17	Lo	Choc / plain	
	18	Lo	Choc / plain	
	19	Lo	Choc / plain	
	20	Lo	Choc / plain	

Card on plain cookie	Part nr	Condition	Choice (circle)	Comments
	21	Gr	Choc / plain	
	22	Gr	Choc / plain	
	23	Gr	Choc / plain	
	24	Gr	Choc / plain	
	25	Gr	Choc / plain	
	26	Gr	Choc / plain	
	27	Gr	Choc / plain	
	28	Gr	Choc / plain	
	29	Gr	Choc / plain	
	30	Gr	Choc / plain	
	31	Co	Choc / plain	
	32	Co	Choc / plain	
	33	Co	Choc / plain	
	34	Co	Choc / plain	
	35	Co	Choc / plain	
	36	Co	Choc / plain	
	37	Co	Choc / plain	
	38	Co	Choc / plain	
	39	Co	Choc / plain	
	40	Co	Choc / plain	