

Master Thesis

The effect of health claims and package colour on food consumption

Marketing and Consumer Behavior

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Preface

This research was conducted as my Master thesis, which is a part of my MSc-programme. It commissioned by the Marketing and Consumer Behaviour group of Wageningen UR and Clymbol, a EU-funded research project that runs from 2012 till 2016. We have worked on this thesis for six months under the help of my supervisor, Ellen van Kleef from the Marketing and Consumer Behaviour group.

It is not an official publication of Wageningen University or Wageningen UR and the content herein does not represent any formal position or representation by Wageningen University.

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Abstract

Background:

The number of obese and overweight people has increased worldwide over the past decades. Overeating is considered a major culprit for this development. At the same time, the healthiness of a food is an important purchase criterion for many consumers. Companies have picked up on this trend, and have thus begun to position their products as healthy to meet consumer demand. Consumers are less inclined to feel guilty as a result of over indulging in so-called healthy food. Their belief in the “healthiness” of the food product tends to cloud their perception of negative effects that can still be associated with overeating of these products.

Some consumer studies have shown that putting a health claim at a food package can backfire. For example, health claims on food packages could lead to increased food consumption. Furthermore, a recent study of Belei and colleagues (2012) provided theoretical underpinnings for this increased consumption. These researchers determined that effects of hedonic and utilitarian modes of consumption lead to different consumer choices. Their results suggest that hedonic claims increase food consumption, while functional claims decrease it. This was said to be an effect of the functional attributes in health claims, which lead to higher levels of health-goal activation than hedonic attributes, while there is no obvious effect on indulgence-goal activation. Moreover, they believe that health claims could prime health-related goals, which would prevent the consumption of a product with hedonic claims written on the package.

Our study partly replicates the aforementioned study, and brings in package colour as a new factor to determine how and if different health claims, and package colour work synergistically to influence chocolate consumption.

Methods:

A two (health claim: hedonic versus functional) by two (package colour: red and green) between subjects experimental design was carried out. A sample of one hundred and thirty undergraduates ate chocolate in order to complete a supposed taste questionnaire after being exposed to the manipulated food package. Participants also completed a questionnaire assessing taste and health inferences, satiety, emotional state, and various background variables such as BMI and restrained eating style. Specifically, health claims and package colour were set as independent variables while the amount of chocolate consumed was the dependent variable. ANOVA was used to examine the effect of health claims on package, taste and health inference, randomisation and manipulation check, and satiety. In addition, responses to the open-ended question about thoughts that come to mind when being confronted with the chocolate package were coded and categorized to examine whether health and/or indulgence goals were activated by the package.

Results:

Although we expected a similar pattern of results as Belei and colleagues, our experimental manipulations did not influence consumption of chocolate. Chocolate consumption was the same regardless of whether a hedonic or functional claim was displayed at the package. Furthermore, red food packages with a low-fat claim did not lead to the highest food intake among the four conditions. Similarly, green food packages with antioxidant claims did not result in the lowest food intake among the four situations. With regard to health, expected satiety and taste inferences, results did not show any difference between functional and hedonic claims, or red and green packages. Similar results were found after analysis of the associations that came to mind after being confronted with the chocolate package. Across conditions, the number of health and indulgence related thoughts were

similar. However, participants felt more hedonic emotions such as happiness after consuming the chocolate with a low-fat claim compared to the antioxidant claim while Negative hedonic and self-conscious emotions (such as regret after eating) were similar across conditions.

Conclusion:

No support was found for the earlier published effect that a hedonic claim leads to more consumption than a functional claim and hence our hypothesis is rejected. This study conducted the underlying process from two perspectives, go-activation and the inference of participants during eating. The four conditions did not reveal different performance in go-activation and the inference of participants; therefore there is no difference on food consumption. However, the food consumption of low-fat group led to more positive emotion after they ate the chocolate. Hopefully, more research is to be conducted to verify the generalization of this result and to research the attribution of health claims' effect on food consumption or the priming of package color. Our result reveal that the all kinds of organizations that work on health or weight control or companies that would like to urge food consumption should not focus on self-control instead of the attributes of health claims and package colors.

Keywords:

Functional claim, hedonic claim, package colour, taste inference, health inference, goal activation, food consumption

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1. Introduction

There is an increase in the number of people who are obese and overweight all over the world in the past decades. The worldwide prevalence of obesity has more than doubled between 1980 and 2008 (World Health Organization, 2008). Based on WHO statistics, in 2008, 35% of adults aged 20+ were overweight (BMI ≥ 25 kg/m²). More than 40 million children under the age of five were overweight in 2010. The obesity problem is particularly prominent in USA and wealthier European countries (Allen, Shannon Carney, Jackman, & Pohl, 2013; Allen, Shannon Carney, Jackman, & Pohl, 2013) Palmer, 2008). This increasing prevalence of citizens in industrialized countries had direct consequences on development of cardiovascular diseases, diabetes and some cancers in the last 25 years (World Health Organization, 2000). Unbalanced energy management and increased food consumption is the primarily cause for the overweight and obesity epidemic. The number of fast food outlets in the USA has increased from about 30,000 in 1970 to more than 233,000 locations in 2004. More and more children like eating fast food, and consume more calories on days in which they ate fast food, compared to days without fast food (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004).

At the same time, the healthiness of food is an important purchase criterion for many consumers (Schifferstein & Ophuis, 1998). As a result, consumers may be full of guilt when they eat too much food, especially indulgent food. In order to indulge in food without feeling the associated guilt and possible negative health effects, consumers themselves are looking for the products that combine “the best of both worlds”. Namely, consumers are eating in the way of healthy indulgence that consumers want delicious foods with a healthy twist to carry off any residual guilt, for example, organic kettle potato chips (Palmer, 2008). Food companies also recognized the importance of labelling healthy information on the food package. They place health claims on the food package, and believe the presented health claims could lead to a favourable attitude of consumers to their products (Kozup, Creyer, & Burton, 2003).

However, previous studies showed that such health claims on food packages may be an important factor of increased food consumption. For example, the studies done by Wansink and Chandon in 2006 showed that low-fat nutrition labels could increase food intake by influencing the judgement of serving size and reducing consumption guilt (Wansink & Chandon, 2006). Moreover, Provencher and colleagues (2009) found that when consumers think that a food is healthy, they eat more. By studying a sample of female undergraduate students, their study contributed to a better understanding of how health claims affect perceptions and in turn influences food consumption.

One of reasons for this phenomenon is that health claims could reduce consumer's guilt and increase pleasure when eating food with health and nutrition claims at the package. Wansink (2010) engaged in an experiment about granola. He explained the increase in intake by focusing on guilt-reduction mechanisms and justification mechanisms. In addition, the health halo of health claims also responsible for food consumption (Lähteenmäki et al., 2010; Schuldt & Schwarz, 2010; Kozup, Creyer, & Burton, 2003). This so-called health halo not only occurs with nutrition and health claims. Schuldt and Schwarz (2010) studied organic claims at food packages and found that consumers think that organic cookies contain fewer calories than conventional cookies.

Yet some researchers think this outcome is far from accurate as the nature of food products cannot be ignored. They hold the view that the hedonic and utilitarian types of consumption effects may lead to different consumer choices (Raghunathan, Naylor, & Hoyer, 2006; Köster, 2003; Roininen & Tuorila, 1999; Belei, et al., 2012). So Belei and her colleagues make the distinction between two types of claims: hedonic and functional health oriented. Their first study showed that these two kinds of claims on food packages could lead to different food consumption effects on consumers.

Specifically, a functional health claim decreases consumption while a hedonic health claim increases consumption when compared with a control condition.

Furthermore, they explained the underlying process of different consumption patterns in their second study. After using lexical decision tasks, they concluded that functional attributes in a health claim lead to higher levels of health-goal activation than hedonic attributes, while there is no obvious effect on indulgence-goal activation. There is a process called goal conflict; different consumption patterns have different goal-conflict levels. Conflict is defined as "an activity which takes place when conscious beings (individuals or groups) wish to carry out mutually inconsistent acts concerning their wants, needs or obligations" by Nicholson (1992). In the third study, they applied a priming technique and demonstrated why functional health claims result in decreased consumption yet hedonic health claims bring about the opposite outcome. Health claims featuring functional food attributes that have a strong association with health (e.g. low cholesterol, vitamin, anti-oxidants, calcium) seems to make the concept of health more accessible in the consumers' mind (Belei, et al., 2012). These health claims stress functional attributes, and in this way help control the amount people consume. In contrast, priming people with an indulgence goal does not alter the previously found effect of health claims on consumption. Hedonic claims focus on the pleasure dimension of food, which lowers the conflict between health and indulgence goals.

In addition, the authors show that small cues in the environment of consumers could interact with the health claims on the package. Specifically, in their fourth study, they exposed participants to subtle cues (functional in nature or hedonic in nature) to examine whether the functional nature of eating could create a conflict with the hedonic goal triggered by claims, in which case the consumption would decrease. The people who experienced the taste test in a functional consumption context were better able to avoid indulging in the low-fat food, while the persons who experienced the taste test in a hedonic consumption context had less resistance towards indulgent food. That is to say, any cues may raise health concerns, which create internal conflict and decrease consumption (Belei, et al., 2012). Other small cues or primes like shape (Bloch, 1995), pictures (Underwood, Klein, & Burke, 2001) and colour might also influence a consumers' food intake.

However past research on packaging mainly focused on the first two cues. In our research we are more interested in the colours on food packages. Red and green might bring about different attitudes to food consumption, because red and green may prime diversely, especially, green might mean healthy for consumers (Schuldt, 2013).

Building on the work of Belei and her colleagues, our study is aimed at replicating their first study in that the effects of functional and hedonic claims on consumption of an indulgent snack (probably chocolate) are examined. Meanwhile, we use package colour as environmental cue and examine the role of package colour in this. We expect that a red package colour in contrast to a green package colour increases a consumers' desire for indulgent eating. Hence, we expect that when indulgent claims are combined with a green package colour, this creates a goal conflict among consumers blocking the consumption effect. We would like to get insight in to their interactive effect.

Based on the above ideas, our main research question is formulated below:

How do health claims and the colour of the package work together to affect food intake of an indulgent snack food?

Sub-questions:

1. Which claims (functional or hedonic claim) lead to higher consumption of an indulgent snack food?
2. Which combination of health claims and package colour (red and green) lead to higher consumption of an indulgent snack food?
3. What is the underlying process that results in different claims and package colour leading to different food intake?

We use a between subjects experimental design as research method, with food consumption as main dependent variable. We recruited students of Wageningen University as participants. There are two factors in our experiment that will be manipulated; one is health claim (antioxidants versus low fat) displayed at the food package shown to participants. The second manipulated factor is the colour of the food package. About half of the participants will be confronted with a red food package and the other half with a green food package. The main objective of our study is to discover how health claims and the colour of package work together to affect food intake. In order to find this, we would like to measure from two main indicators. Firstly, we will measure go-activation by one open-ended question, and analyse it as qualitative and quantitative ways. Then we will measure participants' inference by the quantitative method. In addition, other indicators will be analysed to figure out the results.

2. Conceptual Background

2.1 Consumers' interest in "healthy indulgency"

Nowadays, all sorts of delicious food are flooding our daily life. These foods (such as fast food, sugar-sweetened drinks, chocolate) greatly fulfil consumers need for pleasure and indulgence. However, many studies (Grant, Malaviya, & Sternthal, 2004; Ludwig, Peterson, & Gortmaker, 2001) showed that excessive consumption of such foods have become one of the most important reasons for obesity, which could result in many diseases (e.g., cardiovascular disease (Steinberger & Daniels, 2003), chronic kidney disease (Hall et al., 2004)). The series of problems have prompted people to pursue a healthier diet. Consequently, consumers have gradually started to look for products that provide both superior taste and health benefits (Belei, et al., 2012), the so-called 'healthy indulgences'. Specifically, consumers have a more favourable view of a product's healthiness if the products are contain a general statement claiming that the product is healthy (Andrews, Burton, & Netemeyer, 2000). Such food could satisfy consumers' cravings of indulgent food, while at the same time making they feel healthier. Hence, manufacturers have started to produce so-called health foods to enlarge their market share based on consumer needs, and display health claims on food packages to guide consumers.

However, the recent research has disclosed a backfire effect of presenting inherently unhealthy food as more healthy. Wansink and Chandon (2006) found that labeling food as low fat increases food intake during a single consumption occasion of both normal-weight people and overweight people (Wansink & Chandon, 2006). Geyskens, Pandelaere, Dewitte, and Warlop (2007) showed that exposure to health primes increases the amount of low-fat food consumed, and lead consumers to perceive themselves as closer to their ideal weight (Geyskens, Pandelaere, Dewitte, & Warlop, 2007). Provencher, Polivy, Herman (2009) believed that the healthiness of foods may be of great relevance to food intake and weight gain. Participant were randomly assigned to one of the experimental conditions in a 2 (healthy vs. unhealthy) by 2 (restrained vs. unrestrained eater) by 2 (weight salient or not) factorial design. Consequently, although restrained eating and weight salience did not influence snack intake, participants ate about 35% more in the "healthy" condition than "unhealthy" condition. Moreover, unrestrained eaters had more positive attitudes when their weight was made salient. Schuldt and Schwarz (2010) stated that food labeled "organic" may lead to obesity. Their first study showed that perceivers erroneously deduce that organic food is lower-calorie and that it can be eaten more frequently. Their second study demonstrated that people are more easily to give up exercise when they had just chosen and organic rather than a conventional dessert. To a certain extent, organic food conveys that one has already made progress toward one's weight-loss goal. All these emerging studies suggest that healthful indulgences may not be beneficial to food consumers.

Healthy indulgences are framed as healthful, and stimulate food intake instead of triggering self-control, while the consumption-stimulating cues of health claims function differently (Belei et al., 2012). There is an inverse relationship between hedonic and functional attributes, the so-called 'unhealthy=tasty intuition' (Raghunathan et al., 2006). They find that when information in regard to the assessment of the healthiness of food items is supplied, the less healthy the item is described to be, the better is its inferred taste, as a result, consumers will be more enjoyable during actual food intake and a hedonic goal is more salient. Based on this view, there is a simultaneous decrease in hedonic potential if the degree of functionality is increased.

Specifically, when people eat indulgent foods, for example, chocolate, consumers would like to have the best of both worlds. On the one hand, consumers have a health goal in mind. They pursue a healthy life. On the other hand, they have a hedonic goal as well. They enjoy the indulgent foods during eating, "I really enjoy eating chocolate and I feel pleasure when I am eating it". So there is a

goal conflict of consumers when wanting to consume indulgent food, yet diverse outcomes depend on the consumers.

2.2 Overgeneralisation of nutrition information on food package

Research has indicated that consumers tend to overgeneralize the benefits associated with nutrition-based claims because of ease of justification. During the advertisements marketing, consumers exposed to either the specific ad claims (e.g. no cholesterol) or the general ad claims (e.g. healthy) perceived the advertised brand as significantly lower in fat and significantly more healthy than those exposed to the general claims (e.g. delicious eating) (Andrews, Netemeyer, & Burton, 1998). When consumers buy and read information on food package, they quickly and erroneously infer the substantive function of health claims. In addition, Chandon (2012) found when consumers read a nutrition claim that a sandwich is “healthy” or “low-fat”, they retrieve consistent information (e.g., “this sandwich contains salad”), which may make consumers to infer other nutritional dimensions consistent with it (e.g., “this sandwich is not fattening”).

Wansink and Chandon (2006) further tested the behaviour implications of such generalization. They found the claim of low-fat could bring a countervailing effect, increasing general consumption by up to 50%. Similarly, consumers infer a food described as organic has low-calorie. Then they will eat more and exercise less, which may lead to the increase of weight (Schuldt & Schwarz, 2010). Such inappropriate generalizations can result in the phenomenon known as halo effects.

Halo effects occur if the consumer generalises positive perceptions of other product attributes (Lähteenmäki et al., 2010). This means that if consumers buy food with health labels, they may not only believe that it will help reduce the risk of heart disease, but also help reduce the risk of other diseases (including diabetes and cancer) (Wansink & Cashman, 2006). When favourable health claims are presented, the products are more welcomed by consumers because consumers believe risks of heart disease and stroke to be lower (Kozup, Creyer, & Burton, 2003). Williams obtained a similar conclusion through experimental studies. Consumers think the health claims on foods are useful, and when a product features a health claim they view it as healthier and are more likely to consume it. His experimental studies also emphasized the possibility that the “halo” effect of health claims might hold back consumers from searching more information to evaluate the full nutritional value of a food and whether or not it is really healthy (Williams, 2005). Therefore, the reason that health halos influence food consumption is that people can eat more healthy or unhealthy food after eating healthy food without suffering any negative health consequences (Ramanathan & Williams, 2007). Besides, if a food like a “smoothie” is described as “generally considered healthy”, it will be thought to taste more delicious (Raghunathan, Naylor, & Hoyer, 2006).

Consequently, health halos might influence the volume of food intake and could result in overeating (Chandon, 2012), especially, he believes that halo effects mean people eat more without being aware of it. Therefore, health halos clarify why the increased quantity of healthier fast food restaurants have not led to the expected reduction in obesity rates and in total calorie intake (Chandon & Wansink, 2007). Analogously, there is a 35% greater intake of the same cookie when it was described as a healthy snack instead of indulgent one (Provencher, Polivy, Herman, 2009). In this study, people were also affected by health halos, which might lead to different food consumption between food with and without health claims.

2.3 Hedonic versus Functional claims

2.3.1 The distinction of hedonic and functional claims

Previous studies have divided food types into hedonic and functional foods (Batra & Ahtola, 1991; Johar & Sirgy, 1991). Batra and Ahtola (1991) describe three separate studies proving that consumers deem certain products to have more utilitarian attributes and base their purchase decisions on these, whereas other products are associated with more hedonic attributes.

Functional foods are generally considered as foods in a regular diet that offer a particular health benefit beyond their regular nutritional value (Diplock et al., 1999). Functional foods offer the potential to improve public health when consumed as part of a balanced diet and healthy lifestyle (Hasler, 2002). For example, foods enriched with specific minerals, vitamins, fatty acids, dietary fibre, phytochemicals or other antioxidants fall into this category, while the term hedonic is derived from the Greek term for “sweet” which relates to pleasure (Cramer, 2009). Hedonic foods gain immediate sensory pleasure from great taste and feelings associated, such as candies, chips, ice cream and cookies.

A health claim is defined as “any statement about a relationship between food and health” by European commission. FDA divided the health claims on food package into three types, which are as follows: health claims, nutrient content, and structure/function claims. Health claims have also been divided into hedonic and functional types by some researchers (Raghunathan et al., 2006; Ludwig et al., 2001). These researchers consider health claims that stress a functional attribute (e.g., antioxidants, cholesterol) as functional claims, while those that emphasize hedonic attributes (e.g., fat) are considered hedonic claims.

Belei and her colleagues (2012) drew on research demonstrating an inverse relationship between hedonic and functional attributes. Just like the distinction between functional foods and hedonic foods, the functional claims explain the products functional attributes while hedonic claims might pass on hedonic attributes to consumers. In the experiments of Belei and her colleagues, functional claims and hedonic claims have different effects on food consumption. One of the reasons mentioned for this is the process of ‘primacy of affirmation’ that may occur when consumers process health claims. Primacy of affirmation means that the attributes in a claim rather than their tags (e.g. ‘low’, ‘extra’) are processed. This explains why hedonic claims (such as low-fat) are processed differently than functional claims.

2.3.2 Different effect on food intake

When a consumer chooses a food product, the motivation in his or her mind might play a decisive role. Motivation happens when a need is aroused that the consumer wishes to satisfy (Solomon, 2010). Once a need has been activated, a state of tension exists that drives the consumer to attempt to reduce or eliminate the need. Motivation refers to the processes that cause people to behave as they do (Solomon, 2010). This need may be utilitarian (a desire to achieve some functional or practical benefit, as when consumers eat food with health claims for health reasons) or it may be hedonic (an experiential need, involving emotional responses or fantasies, as when consumers want to eat unhealthy food)

When we desire a goal but wish to avoid it at the same time, an approach- avoidance conflict exists. Specifically, the concept of hedonic is strongly linked with approach behaviour in contrast to the concept of functional which is more naturally associated with avoidance behaviour. According to Belei and her colleagues, hedonic claims stress the hedonic characteristics, which make health goals less accessible while accentuating the pleasure dimension of food. Consequently, it causes lower goal conflict and increased consumption of the food. Functional attributes trigger high levels of health-

goal accessibility, which results in a goal conflict as there is a simultaneously accessible indulgence goal linked with the indulgence. Finally, the conflict might lead to reduced consumption.

The general thoughts of “dichotomous thinking” (Rozin, Ashmore, & Markwith, 1996) influenced food consumption when it comes to health claims on food package. People categorize food options according to a good/bad dichotomy. For example, when they are presented with a meal that combines both a virtue and a vice, people take shape an overall impression of this meal's healthiness in a way that the vice/virtue combination is thought to be healthier than the vice alone (Freeland-Graves & Nitzke, 2002 ; Rozin, Ashmore, & Markwith, 1996). Consumer may oversimplify the relative healthiness of foods by categorizing them into either good or bad foods (Andrews, Burton, & Kees, 2011). For example, vegetables and fruits are often deemed healthy and thus are classified as virtues. Oppositely, “indulgent” foods (e.g., chocolate, burgers, and fries) are always thought as unhealthy foods. This dualistic theory also can be applied to health claims of food packages, for instance, the words like “organic,” “light,” “fat-free,” and “low-fat” are defined as virtues while the options like “rich,” “creamy” and “decadent” are described as vices (Wertenbroch, 1998). However, in real life, there are many levels between good and bad. It is hard to say that there are no absolute good things or absolute bad things, but most things in the world are both good and bad, food included. Consumers might misunderstand the meaning of health claims on food packages. When consumers test chocolate with “low-fat” on package, it is easier to compare “low-fat” with “fat”. According to the thoughts of “dichotomous thinking”, the consumer might think “low-fat” as a virtue, and will then eat more than without this claim.

In theory, primacy of affirmation is also one of the most important reasons that cause different consumption between consumers testing food with hedonic claims and functional claim. Primacy of affirmation means the resources are allocated in a specific sequence (Grant, Malaviya, & Sternthal, 2004). Initial resources are allocated to the processing of an affirmation. If additional resources are available, they are used to process the negator (Just & Carpenter, 1976). Specifically, the attributes in a claim rather than their tags (e.g. ‘low’, ‘extra’) are easily processed, which explains why hedonic claims (such as low fat) are processed differently than functional claims. However, according to Grant and his colleagues, processing of a negation is more resource demanding than the processing of an affirmation. For example, participants who were told that the target was “low-fat” initially focused their eyes on the fat position. When a negation is represented in memory, as indicated by the accurate immediate recognition of objects that were absent, the negator is less accessible than the affirmation after a delay, evidenced by the rate of affirmative intrusions (Fiedler, Walther, Armbruster, Fay, & Naumann, 1996). Belei and her colleagues support this theory further. They use “cholesterol” to replace “low-fat” as the hedonic claims but got the same results. Therefore, they predict that the consumption increasing effects of low-fat claims can be generalized to all hedonic claims, even to hedonic claims that are more difficult rather than easier to justify.

2.3.3 Priming health may block overconsumption effect of hedonic claims

Priming is defined as “activated incidentally or unobtrusively in one context, to influence what comes next without the person’s awareness of this influence” (Bargh, 2006). It increases sensitivity to certain stimuli due to prior experience and relies on implicit memory. Priming is different from memory. The priming effect could impact the decision-making process (Jacoby, 1983).

Belei and colleagues (2012) divided health claims into functional claims and hedonic claims. For the health claims stressing functional attributes, the hedonic indulgence goal is salient and results in a high conflict between the opposing health and indulgence goal (Belei, et al., 2012). On the contrary, the health claims featuring hedonic attributes render a health goal temporarily less accessible. Consequently, the conflict between health and indulgence goals is low (Belei, et al., 2012). During this process, healthy or hedonic claims play a role in priming. Specifically, functional claims prime health goals in consumers’ minds while hedonic claims prime the indulgence goal of consumers.

We expect that there are different levels in health and indulgence goal conflicts between hedonic claims and functional claims. Raghunathan, Naylor, and Hoyer (2006) found that health claims featuring functional food attributes that have a strong connotation of “health” should make the concept more highly accessible in consumers’ minds. Namely, the less healthy the item is described, the better the taste is inferred by consumers, and hence, the more pleasure the experience during consumption. Moreover, unhealthy items strengthen hedonic goals. In our studies, health claims and especially functional claims might reduce the hedonic goal compared to food without health claims, or with hedonic claims on the package.

In addition, Berger and Fitzsimons (2008) did a prime study. They think that real-word environmental cues can activate or make more accessible—related products representations, as when more real-word orange cues in the environment appear, orange-related products were more accessible. Similarly, a lot of cues in consumption environment could also prime health or indulgence of consumers. For example, package colour could be one of cues because colour prime differently. Although at first glance it would appear to be nutrition information for consumers, colour itself carries symbolic meaning with psychological implications (Elliot, Maier, Moller, Friedman, & Meinhardt, 2007).

2.3.4 The colour of food package

Past research shows that package colour in the food industry has two main utilities. One is to attract the consumers’ attention (Grimes & Doole, 1998); the other is as stimulus-based information (Burke & Jones, 2000). In research, food colours were found to communicate product taste and flavour. In particular, green has a attribute-level meaning of ingredients while red has the meaning of taste. At consequence-level meaning, green brings a feeling of trustworthiness (Kauppinen-Räsänen & Luomala, 2010). Based on the psychological literature, the colours carry symbolic meaning which could influence judgment and decision-making (Elliot & Niesta, 2008). Similarly, consumer research considers colour as an environmental cue that influences the perception of health (Andrews, Netemeyer, & Burton, 1998; Chernev & Gal, 2010; Wansink & Chandon, 2006).

Some studies show that brightness provokes goodness and purity, whereas darkness is often linked with evil and sin (Meier, Robinson, & Clore, 2004; Sherman & Clore, 2009). Zhang and Wadhwa (2011) showed that a dark background colour (e.g. black), as opposed to bright background colour, enhance consumers’ desire for indulgent consumption through three studies. They speculate that this is because darkness is associated with sinful pleasure and fun. Normally, a green light means “go” and red light means “stop”, just as the Multiple Traffic Light system, the Food Standards Agency in the United Kingdom developed their signals, green stands for healthy and red represents unhealthy nutrient levels. In addition, green is the dominant colour of many food labels, such as, EU organic, USDA and so on. Green may also be connected with “natural”. These may further promote the perceived level of health.

People often connect green with organic or healthy, whereas they connect red with indulgence. Schuldt tested a candy bar would be perceived as healthier when it bore a green rather than a red calorie label that revealed same calorie content (Schuldt, 2013). In order to test whether green labels promote healthful perceptions, he did a further experiment and found that the green label could promote a more healthy perception compared with the other colours (white). He thinks that green labels carry a health halo that encourages consumers to see a relatively poor nutritional food as healthier than would be otherwise. It has also been shown that children favour certain colours when choosing sweets (Walsh, Toma, Tuveson, & Sondhi, 1990). More specifically, regardless of age, sex or food type, there were large differences in the specific colors chosen by the children tested. Most children tested connect red with “tastes best”.

2.4 Conceptual Model and Summary

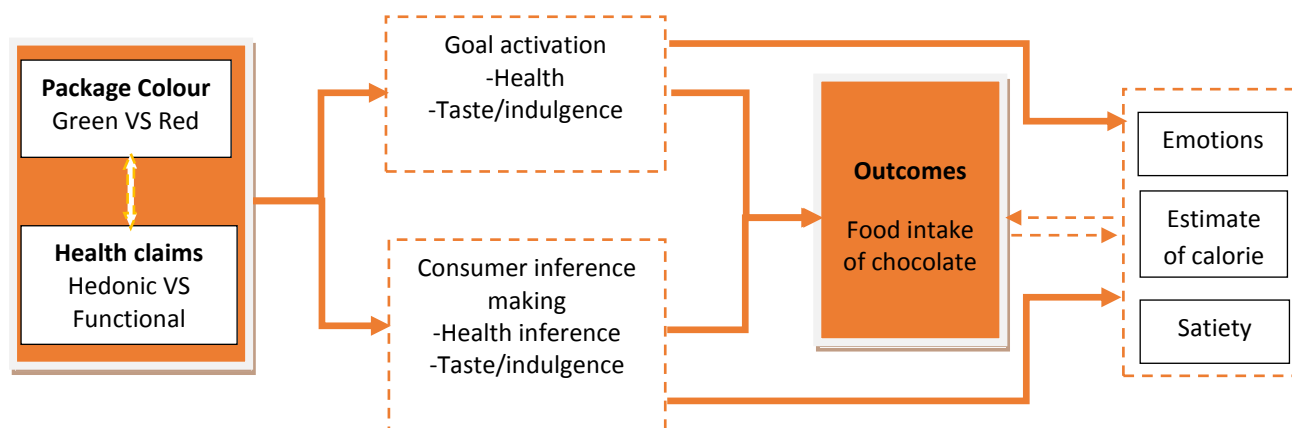


Figure 1. The conceptual Mode of this study

The framework of this study is described in Figure 1.

After the literature research, package colour and health claims were chosen as the two main independent variables. Based on previous studies, health claims are divided into either hedonic or functional by nature (Belei et al., 2012). At the same time, green is considered as an environmental cue that might prime health while red is supposed as a contrast which may prime indulgence during experimentation (Schuldt, 2013). Through a 2 (functional and hedonic) by 2 (red and green) between subjects experimental design, the difference in the volume of food consumed in each condition was compared. The aim is to determine the main effect of health claims and package colour on food intake, as well as the interactive effect between health claims and package colour.

According to the framework above, there is an underlying process between the two factors and the dependent variable - food intake. This explains why and how factors influence food intake of indulgent snacks. Research will be conducted from two perspectives as showed. One is go activation of health and taste, the other one is consumer inference making of health and indulgence. Healthy or indulgent signals could trigger diverse taste inferences (Raghunathan et al., 2006). Consumers prefer food labelled with healthy claims, and consequently consume more due to the health halo effect (Chandon & Wansink, 2007). In addition, according to the reason that the health food may reduce negative emotions such as guilt, leading the consumer to believe that they are closer to their ideal weight (Schuldt & Schwarz, 2010), we put emotion factor here. It also includes positive emotions measure. We supposed there will be a relation between emotions and food consumption. The similar reason is applied in estimate of calories and satiety.

Based on the research of Belei and her colleagues (2012), functional claims trigger health goals in consumers' mind while hedonic claims strengthen indulgence. Health claims and food package colours are two important factors that led to the existence of this internal conflict of goal attainment and pleasure-seeking.

The specific goal of this study to explore the relationship between health claims on food packages and food intake. To do this, an investigation of how much consumers eat under both conditions will be studied, as well as the underlying process of a consumer's reaction to health claims. Functional health claims linked to indulgence are expected to trigger reduced consumption of the foods bearing

these claims, whereas hedonic health claims attached to indulgences would simulate increased consumption.

“Low fat” is an example of a hedonic claim because it was thought that it may result in the overconsumption of calorie-rich and nutrient-poor snack foods by 65% of U.S. consumers who are already overweight. Furthermore, it was expected to lead to overconsumption due to the common association between good taste and enjoyment. It seems that many companies positioned their products as “low-fat” (Subway roast beef sub sandwich, Haagen-Dazs chocolate sorbet, Boca Burger Grilled Vegetable burger, etc.). While “contains antioxidants” represents a functional claim. The expectation is that hedonic attributes lead to higher consumption than functional attributes due to the activation of goal conflict. It is possible that antioxidant claims on food labels result in higher levels of health-goal activation than low-fat claims labelled on the same food package, while having no differential effects on indulgence-goal activation (Belei et al., 2012).

Importantly, the fourth study of Belei and her colleagues shows that any cue in the marketing environment that raises health concerns can create an internal conflict, and thus decrease consumption of indulgent food. These cues may include advertisements, labels and package information. Here, package colour will be taken as an environmental cue to prime health or indulgence. Consumer food intake is also influenced by package colour. As green may activate healthy goals, while red activates the indulgence goal (Schuldt, 2013), those who experience the taste test in the front of a green package is possibly more able to refrain from indulging in the low-fat food.

The core objective of our research is to examine how package colours (green and red) and the health claims (hedonic, functional, no claims) influence food intake. Hence our two hypotheses state:

H1: Hedonic attributes lead to higher consumption compared to functional attributes.

H2: Red food packages with a low-fat claim leads to the highest food intake among the four conditions while green food package with an antioxidant claim on it results in the lowest food intake among the four situations.

All in all, different combinations of package colour (red versus green) and health claims (hedonic versus functional) lead to a different level of food consumption. Furthermore, food consumption is influenced by two main underlying processes. One is goal activation, the other is consumer inference making.

As to the goal activation process, there are four conditions in total: Red package- Functional, Green-Functional, Red-Hedonic and Green-Hedonic. However, it is expected that hedonic health claims with red packages to simulate increased consumption, while the functional claims with green packages will decrease the food consumption. Since both a green food package a functional claim could instigate healthy goals of consumers a red food package with a hedonic claim will have the opposite effect.

Moreover, health and taste influence food consumption regarding food packages with no claims. The “Halo effect” (Chandon & Wansink, 2007) may lead consumers to incorrectly assume the healthiness of a food; and the “unhealthy=tasty intuition” (Raghunathan et al., 2006) may influence the evaluation of taste, and result in varied food intake.

Lastly, the emotion, estimate of calorie and satiety will be taken into account to how they affect food consumption and how they will be affect after participants eat food.

3. Methodology

3.1 Design

Based on previous theoretical backgrounds, four different types of chocolate packages were formulated, varying in health claims and package colours. These packages were designed in a 2 (health claims: hedonic versus functional) x 2 (package colours: green versus red) between subjects design (table 1). Each participant was assigned to only one experimental condition in between-subjects' design, which could avoid carryover effects.

Table 1. Four types of chocolate packages

Health claims on stimulus material package	Package colour of stimulus material	
	Green	Red
Laag vetgehalte (Low-fat claim)	LG	LR
Met anti-oxidanten- gezondheid van de cacaoboon (Antioxidant claim)	AG	AR

3.2 Participants

One hundred and thirty undergraduates (73 females, 51 males) were recruited in the Leeuwenborch and Forum of Wageningen University for this study. Only Dutch students were allowed to participate to filter out cultural differences. Consequently, the questionnaire and recruitment leaflet was in Dutch. Their ages ranged from 18 to 50 ($M=21.92$, $SD = 3.58$). Most of them were from same university so they possibly had similar age and education background. Such similarity of each group reduced the "matching problem" to some extent. Matched sampling is defined as "a method of data collection and organization designed to reduce bias and increase precision in observational studies" according to Rubin (1973). Furthermore, students who are averted to or allergic to chocolate were excluded in advance because they the leaflet indicated that they could better not participate. Participants were assigned to one of conditions (four conditions in total) randomly by computer program. Specifically, each condition had about 30 subjects (33 participants in functional claim of green package red package respectively, 32 participants in hedonic claim of green package and red package respectively) (table 2) randomly assigned by the computer.

Table 2. Profile of the participants

Gender (N)	Functional claim (antioxidants)		Hedonic claim (low-fat)	
	Green	Red	Green	Red
Male	10	14	12	15
Female	23	19	20	17
Total	33	33	32	32

3.3 Stimulus Material

3.3.1 Indulgent snack food

Chocolate, a popular indulgent snack which is easily acceptable and measured, was selected as the stimulus material. To increase variance in food intake, we selected chocolate in a small unit size. Participants received a bowl with 150 grams of chocolate to ensure that more than enough chocolate was available to eat. A small unit size of chocolate (approximately 1g per unit) was utilized instead of a large block to increase the variance, because it increased the likelihood that people strongly monitor what they eat. After compared several brand of chocolate, the Choco Crunchies of C1000 brand was decided as it meets requirements (figure2).



Figure 2. The Choco Crunchies chocolate used in experiment

3.3.2 Package manipulation

Adobe Photoshop software was used to manipulate package colours and health claims. An existing package of so-called 'Chocolate Crunchies' was photographed and adapted in overall package colour (green versus red). In addition, for health claims, 'Laag vetgehalte' (low-fat) was put behind the brand name to represent the hedonic claim. As a functional claim, we selected 'Met anti-oxidanten' (Antioxidants), similar to Belei and colleagues (2012) was chosen as a representative due to its increasing prominence on various food packages. Antioxidants have gained a reputation for their clearly functional rather than hedonic benefits on health. In order to increase reliability, antioxidants were explained by 'gezondheid van de cacaoboon' (from healthy cacao). These manipulations resulted in four different chocolate packages (Figure 3).



Green package with low-fat claim



Green package with antioxidant claim



Red package with antioxidant claim



Red package with low-fat claim

Figure 3. Four manipulated packages of Choco crunchies

3.4 Measures

3.4.1 Manipulation check

For the purpose of ease and validity of experiment (i.e., participants were students engaged in their daily routine and the package were manipulated by Adobe Photoshop), five single-items (table 3) measures were embedded into the experiment as manipulation check of the integrated packaging variants. Participants had to indicate to what extent they agreed with these statements. Responses were recorded a 7-point rating scale ranging from “totally disagree (1)” to “totally agree (7)”.

Table 3. Statements from the questionnaire regarding package perception

Package perception items
1. The design of this package is attractive;
2. The information at the front of the package is credible;
3. This is a nice package;
4. Choco Crunchies are packed in a convenient way;
5. This package shows vitality.

3.4.2 Randomisation check

Respondents were asked certain questions to check if the treatment and control subjects were balanced at baseline, since the participants of four conditions were chosen by computer randomly. The variables used for randomization check include: BMI (calculated based on self-reported height and weight), age, gender and restrained eating style.

Participants provided self-report of their height and weight, which were used to calculate Body Mass Index (BMI). Based on WHO in 2004, body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). It was put in the last part for avoiding affecting the result as some information might prime health or indulgence. In addition, the demographic survey of participants included age and gender.

Moreover, there might have a difference between the participants who have the tendency to restrain their eating and participants who do not have this tendency. Restrained eating style was therefore measured in the experiment by ten questions. The restrained style subscale of the Dutch Eating Behavior Questionnaire (Van Strien, et al., 1986) was used to assess dietary restraint (table 4). Participants responded on a 5-point scale (from very often to never) and the average of their scores was defined as restrained style.

In addition, we measured “are you dieting at this moment?” in the questionnaire. Participants responded on a 7-point scale (1 = not at all; 7 = extremely) as to this question.

Table 4. Questions from the questionnaire regarding restrained style (Van Strien, et al., 1986)

Construct (Cronbach's Alpha=0.91, N=10)	
1.	When you have become slightly heavier than you eat less than usual?
2.	Try to eat less during meals than you would like?
3.	How often do you refuse to eat or drink because you are afraid that you will be heavier?
4.	Do you exactly with what you eat?
5.	Eat your intentional products which you lose weight?
6.	When you've eaten too much you eat the next few days less?
7.	Do you eat less deliberately to avoid being heavier?
8.	How often do you try to take any snacks because you watch your weight?
9.	How often do you try not to eat in the evening as you watch your weight?
10.	Do you consider your weight when you eat?

3.4.3 Goal activation

An experimenter displayed one open-ended question after participants watching the food package to measure which goals (hedonic versus health) were more or less accessible on consumers' mind. The question that we are interested in things that come up when people think of food. What thoughts come to mind when you think of eating at the moment was displayed and we advised participants to write as much or little thoughts as you want.

Participants were asked to list the first things that came to mind when thinking of 'Chocolate Crunchies' (Max. 8 answers). They could write down as many as items they want. In this way, we measured which goals (hedonic versus health) were more or less accessible on consumers' mind, which was similar to the procedure used by Berger and Fitzsimons (2008). Specifically, this part aimed to measure one of underlying processes, go-activation of health and indulgency.

After collecting data provided by participants, I used Google translate to code relevant information. Health-related words and indulgency-related words were the core task during coding.

3.4.4 Health and taste inference

After being given the chocolate, a questionnaire was displayed on the computer. It was used to test health inference of participants. It contained 18 items, which contained statements related with health inference, statements related with taste inference and chocolate package related statements. It measured health inference with statements, for example, "this chocolate is healthy". Taste inference was measured as a similar way in the questionnaire. Participants were asked to report their opinions from totally disagree (1) to totally agree (7) (table 5).

Table 5. Statements from the questionnaire regarding product perception

Constructs
Deliciousness ($\alpha=0.84$, N=3)
1. This chocolate looks delicious;
2. This chocolate is tasty;
3. This chocolate tastes delicious.
Ability of satiate ($\alpha=0.83$, N=5)
1. This chocolate is satiating;
2. This chocolate gives a full feeling quickly;
3. This chocolate will satisfy for a long time;
4. This chocolate will give a full feeling till the next meal;
5. This chocolate is fattening.
Promotion of weight gain ($\alpha=0.75$, N=4)
1. This chocolate contains a lot of sugar;
2. This chocolate contains a lot of fat;
3. This chocolate is very calorie rich;
4. This chocolate will make you gain weight
Related to healthiness etc.
1. This chocolate is healthy;
2. This chocolate gives energy;
3. This chocolate is a responsible choice;
4. This chocolate is a cheap snack;
5. This chocolate is appropriate as a light snack;
6. This chocolate contains useful nutrients.

3.4.5 Emotions state after eating

Adapted from the scales developed by Ramanathan and Williams (2007) we asked participants to which degree (from 1 – totally disagree to 7 – totally agree) they experienced a series of emotions. Positive hedonic items include ‘fun’, ‘relaxed’, ‘pleased’, ‘satisfied’, and ‘happy’. In addition, enjoy was added in this scale ($\alpha=0.82$). Negative hedonic items are ‘depressed’, ‘stressed’, ‘angry’ and ‘frustrated’, disgusted was wiped out from the scale ($\alpha=0.79$). Negative self-conscious emotions are ‘guilty’, ‘ashamed’ and ‘regretful’ ($\alpha=0.81$). Participants responded on a 7-point scale (1 = not at all; 7 = extremely). Cronbach’s alpha for this scale was greater than 0.63 (table 6).

Table 6. Statements from the questionnaire regarding emotions (Ramanathan and Williams, 2007)

Constructs
Positive hedonic items ($\alpha=0.82$, $N=6$)
1. How did you feel during the eating of the chocolate – fun
2. How did you feel during the eating of the chocolate - relaxed
3. How did you feel during the eating of the chocolate - pleased
4. How did you feel during the eating of the chocolate - satisfied
5. How did you feel during the eating of the chocolate - happy
6. How did you feel during the eating of the chocolate - enjoying
Negative hedonic items ($\alpha=0.79$, $N=4$)
1. How did you feel during the eating of the chocolate - depressed
2. How did you feel during the eating of the chocolate - stressed
3. How did you feel during the eating of the chocolate - angry
4. How did you feel during the eating of the chocolate - frustrated
Negative self-conscious items ($\alpha=0.81$, $N=3$)
1. How did you feel during the eating of the chocolate - guilty
2. How did you feel during the eating of the chocolate - shame
3. How did you feel during the eating of the chocolate - regret

3.4.6 Satiety index

Feelings of hunger and satiety were measured on series of 100mm visual analogue scales by answering the questions: 'How hungry are you?', 'How full are you?', 'How satiated are you?', all anchored by the terms 'not at all' to 'extremely' and the questions: 'How strong is your desire to eat?' anchored by: 'extremely low' to 'extremely high' and 'How much do you think you could eat right now?', anchored by: 'nothing at all' to 'a very large amount' (Blundell et al., 2010) . Participants completed these questions before and after consumption.

The score of three questions (how hungry are you feeling right now; how much do you want to eat now; to what extent do you wish to eat now?) measure were reverse-scored and averaged together with the other two questions (how full are you feeling right now; how satisfied are you feeling right now?) to create the two composite variables, perceived average satiety before and average satiety after.

3.4.7 Estimate of consumption

Participants were asked to estimate the number of calories they just ate at the end of experiment. For grams, the slider ranged from 0 till 1500 calories. By doing this, we checked if the discrepancy between estimate of calorie and real consumption calorie showed differently in each condition. Their real calories consumed during were calculated based on the calorie indicator on chocolate package, which was 475 calories per 100g. Then the discrepancy between estimate of calorie and real amount of calorie consumed of each participant were used to analyse.

3.4.8 Dependent variable-Consumption of chocolate

All participants were given 150 grams of chocolate in a bowl. Unbeknownst to the participants, the remaining chocolate was weighed after the taste test. By matching the number they input in computer, the amount of chocolate each participant consumed was known.

3.5 Procedure

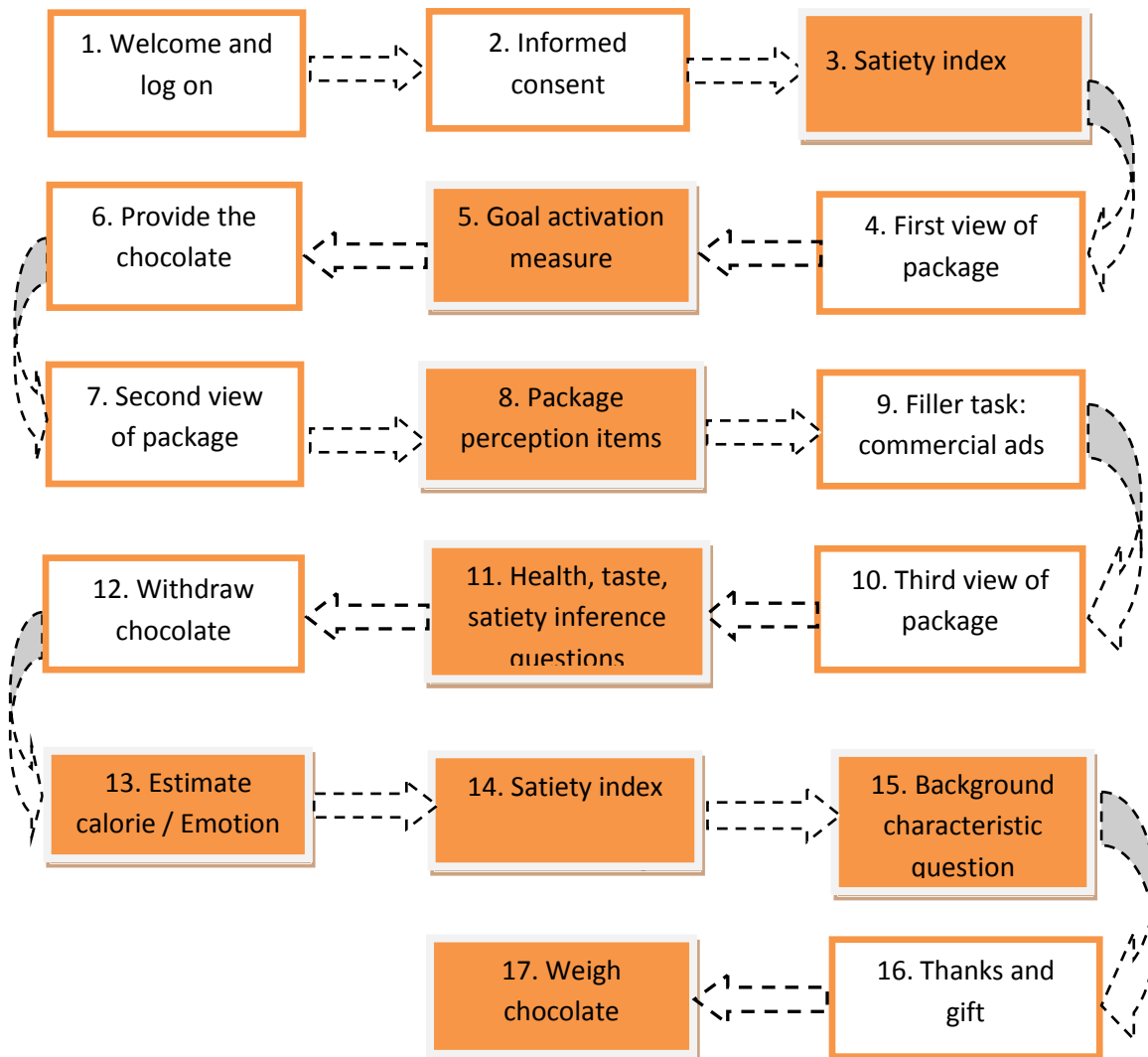


Figure 4. Flow chart of experiment

The whole experiment was conducted in four days in total in a computer room of Leeuwenborch (the first day) or Forum (the last three days), Wageningen University. The whole experiment consisted of 17 steps showed in figure 4, and the steps coloured fill orange were key procedures.

Upon arriving to the experimental site, subjects were seated at individual computer stations. Before beginning their set of tasks, the experimenter introduced the experimental procedure and informed participants that they would finish a number of tasks related to how people think about a new chocolate product. Participants were asked to log on their own account of Wageningen University and went to the website of this experiment given by experimenter.

At the beginning of the task, participants were randomly assigned by a computer algorithm to one of four conditions. Every participant reviewed an informed consent form to explain their rights during experiment and they were asked to confirm that they were willing to take part.

Then participants answered five questions about satiety at the first time.

Next, based on the instruction gave by experimenter participants were presented one of chocolate packages mentioned before for at least 15 seconds to make sure that they had been exposed to the health claims and package consciously (figure 5).



Figure 5. View of package during experiment

After watching chocolate package on screen, participants were asked to list the first things that came to mind when thinking of 'Chocolate Crunchies' (Max. eight answers). After participants finished the first part, they were informed to raise their hand and called researcher for second part of experiment.

During the second part, 150 grams of chocolate was placed in a plastic bowl for each participant where they received instruction to taste the chocolate and eat as much or as little as they desired. Participants were shown the same chocolate package for the second time. They then could taste chocolates and answered questions at the same time. In addition, all participants finished 5 statement judgements pertaining to the chocolate package evaluation on several seven-point scales related to colour, design and so on.

For enlarging the time that participants taste chocolate, a commercial ad which was unrelated to the main study was included after finishing this questionnaire, participants also needed answer a series of questions pertaining to that advertisement.

Then participants watched the chocolate package at the third time. Taste inference and health inference were measured by a serious "quick thinking" questions, Experimenter asked each participants write their number of experiment on computer into the yellow paper in front of them afterwards. In addition, experimenter removed the chocolate from in front of participants.

After finishing the second part, participants read the chocolate package on the computer again and continued questions concerning background information. Firstly, they estimated the calorie they consumed (the calories was from 0 to 1500). Secondly, they answered serious questions pertaining emotions after tasting chocolate. Then participants were asked to write down the number that was attached to their chocolate bowl. After that, they were asked to call the experimenter, who then took away the leftover chocolates. The number was used to connect the responses in the questionnaire to the measured grams of chocolate consumed.

Thirdly, participants answered five questions to test the feelings of hunger and satiety again. It was better to know their satiety state after experiment to measure the extent of participants' satiety during experiment. Moreover, they answered some basic questions about their information such as gender, restrained eating, BMI, age and in the last part of experiment.

Finally, participants were thanked for their participation in the experiment, debriefed, and dismissed. At the same time, we gave away two bags of flower seeds to each participant as gift. After the experiment and unbeknownst to the participants, the experimenter secretly weighed how many grams of the chocolate each participant had consumed.

3.6 Data analysis

Statistical analyses were done using SPSS Version 19 for Windows. Descriptive statistics were shown as mean (standard deviation) unless noted otherwise. From self-reported body weight and height Body Mass Index (BMI) was computed.

Randomisation check was conducted by two-way ANOVA, while gender difference was examined using Chi-square test. To test whether the package colour and food claims on it manipulations would sustain in the integrated packages, an ANOVA was conducted with packaging colour as well as food claims, and perceived packaging item as dependent variable.

In order to investigate whether taste and health inference were different among four conditions, ANOVA were computed to the mean score of scale and separate items. Similarly, go activation was examined by ANOVA as well after qualitative analysis to participants' responses.

We also examined the effects of health claim and package colour manipulation on satiety ratings at two points in time. We conducted a mixed model ANCOVA with measurement time as within subjects factor (two levels: before eating, after eating) and health claim and package colour as between subjects factors to assess differences in satiety between conditions and measurement time. To control for influence, BMI was included in the model.

As to the chocolate assumption, we examined the effects of health claim and package colour on the amount of chocolate consumed (gram) by ANOVA, including the effect of BMI. When the P-value was larger than 0.05 and less than 0.1, we deemed them as "marginally different". If the P-value was lower than 0.05, it was considered as "significantly different" in results.

4. Result

4.1 Descriptive statistics

One hundred and thirty respondents (male: 51; female: 79) were assigned randomly to one of four conditions in this study (no participants were excluded). I analysed detailed statistics of the four conditions, including mean age, restrained eating style and BMI. Most participants (94.6 %) were in the normal weight range (18.50-24.99), 5.4% were underweight, and no participants were overweight based on principal cut-off points of WHO.

4.2 Randomisation check

Group differences were examined for categorical variables with chi square tests (e.g., gender), and for continuous variables (e.g., age) with ANOVA. Results revealed that the experimental group did not significantly differ with regard to gender distribution (Chi-square=0.47, $p=0.50$), average age and restrained eating on main effect of health claims and package colour, as well as interactive effect (all $P>0.05$, see table 7). Furthermore, there were no differences in restrained eating style across conditions ($P>0.11$).

Results for BMI were, however, significantly different between certain groups (See Table 7). Participants of the red package condition had a lower BMI than participants of the green package condition (M green = 22.2, M red= 21.3; $F=4.9$, $P=0.03<0.05$) A significant difference was not observed between the functional group and hedonic group (M functional=21.6, M hedonic= 21.9; $F=0.65$, $p=0.42$), although the P-value column indicates a marginally significant interaction trend ($F=3.6$, $P=0.06$). If BMI has an influence upon food consumption, the variable BMI participant values may have influenced experimental results, especially between red package and green package conditions, ($F=2.24$, $P=0.06$). BMI was included as a covariance in the analysis of chocolate consumption to filter out its effect.

In summary, differences in personal background variables (i.e., age, gender, restrained eating, BMI) were observed across the four conditions only for BMI. In addition, perceived participant satiety did not differ across the four conditions (all $P>0.05$).

Table 7. Randomisation check (Mean (SD) and P-value)

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of package colour</i>	<i>Interaction effect</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>(N=32)</i>	<i>(N=32)</i>			
Age	21.8 (2.6)	21.9 (2.2)	22.1 (5.5)	22.0 (3.3)	0.74	0.96	0.89
BMI	21.7 (1.6)	21.5 (2.5)	22.8 (3.1)	21.1 (2.0)	0.42	0.03	0.06
Restrained scale	2.2 (1.5)	2.2 (1.6)	2.1 (1.5)	1.7 (1.1)	0.19	0.39	0.33
Restrained style	2.2 (0.86)	2.1 (0.72)	2.1 (0.72)	1.8 (0.69)	0.13	0.11	0.53

4.3 Manipulation check

The perception and reaction of participants to chocolate product packaging was tested by four questions I sought to determine how certain package attributes affected perceived product attractiveness and credibility. Participants in the hedonic claim group were more attracted by the package ($M_{\text{antioxidant}}=4.2$, $M_{\text{low-fat}}=4.6$; $F=3.0$, $p=0.09$) and thought the green package was less attractive ($M_{\text{green}}=4.2$, $M_{\text{red}}=4.7$; $F=3.2$, $p=0.04 <$) (Table 8).

Similarly, hedonic group participants had a significantly greater likelihood of finding package information credible than functional group participants ($M_{\text{antioxidant}}=2.7$, $M_{\text{low-fat}}=3.4$; $F=8.5$, $p=0.004 < 0.05$).

With regard to the term "nice package", the package with a "hedonic claim" was perceived to be "nice" more often than the red package ($M_{\text{antioxidant}}=3.6$, $M_{\text{low-fat}}=4.1$; $F=4.2$, $p=0.04 < 0.05$). The "nice package" perception of respondents was marginally different between green and red packages ($M_{\text{green}}=3.7$; $M_{\text{red}}=4.1$; $p=0.07$). There were no differences between participants for perception of packages as "convenient".

Table 8. Manipulation check

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of colour</i>	<i>Interaction effect</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>N=(32)</i>	<i>N=(32)</i>			
Attractiveness	3.9 (1.4)	4.6 (1.5)	4.4 (1.6)	4.8 (1.4)	0.10	0.04	0.62
Credibility	2.7 (1.4)	2.7 (1.0)	3.6 (1.5)	3.3 (1.4)	0.00	0.47	0.55
Nice package	3.4 (1.2)	3.9 (1.5)	3.9 (1.6)	4.3 (1.1)	0.04	0.07	1.0
Convenient package	5.0 (1.4)	5.1 (1.2)	5.5 (1.2)	5.0 (1.2)	0.36	0.37	0.30

4.4 Amount of chocolate consumed

We conducted analyses of covariance with health claims on food packaging (hedonic claim vs. functional claim) and package colour (red and green) as two between-subject independent variables. The grams of chocolate eaten was set as the dependent variable. BMI was included as a covariance in this analysis.

We did not observe a significant influence of health claim (ANOVA, $F(1, 126)=2.0, p=0.16$) or package colour (ANOVA, $F(1, 126)=1.3, p=0.26$) upon chocolate consumption. Participants consumed similar amounts of low-fat chocolate ($M_{\text{low-fat}}=30.2, SD_{\text{low-fat}}=20.3$) and antioxidant chocolate ($M_{\text{antioxidant}}=35.8, SD_{\text{antioxidant}}=25.1$) and similar amounts red package chocolate ($M_{\text{red}}=30.6, SD_{\text{red}}=23.3$) green package chocolate ($M_{\text{green}}=35.6, SD_{\text{green}}=22.4$). Participants in the hedonic-attributes condition did not consume significantly more chocolate than participants in the functional- attributes condition. As a result, our first hypothesis stating that hedonic claims lead to higher consumption compared to functional claims can be rejected. The variances of each condition are very large, as shown in Figure 6.

There was no difference in chocolate consumption among the four different conditions ($F(1, 126) = 0.23, p=0.63$). Participants in red package condition with low-fat claim consumed $M_{\text{low-fat_red}}=26.5$ grams chocolate. Participants in green package condition with antioxidants claim consumed $M_{\text{Antioxidant_green}}=37.2$ grams chocolate (Figure 6). Our second hypothesis, was that, across the four conditions, the highest food intake would occur for red food packages with a low-fat claim and the lowest food intake would occur for green food packages with an antioxidant claim. We rejected this second hypothesis as well.

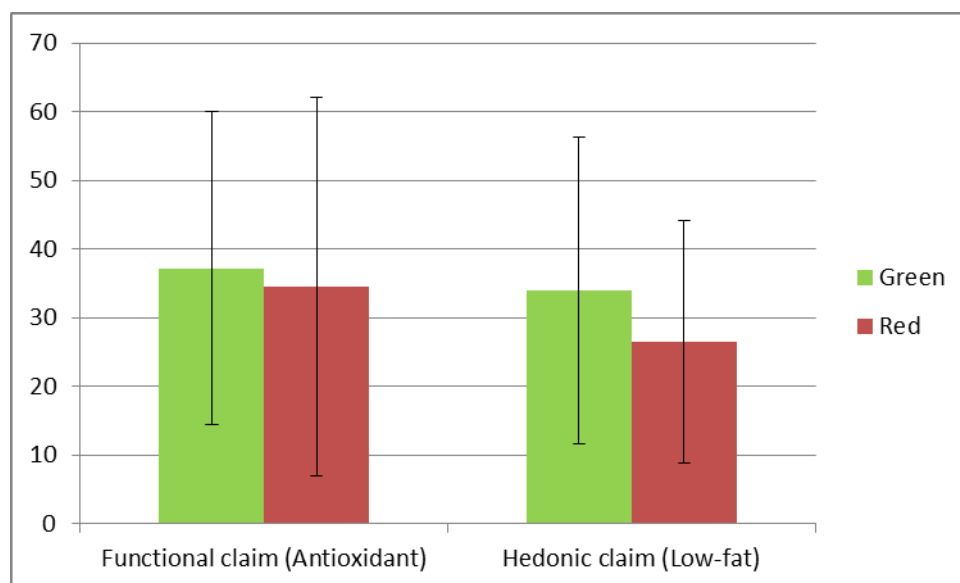


Figure 6. Chocolate consumption as a function of type of health claim and package colour

4.5 Satiety index

To determine if a change in satiety was affected by our manipulation, the repeated model ANCOVA was analysed. It demonstrated a significant main effect of time of measurement ($F(1,125) = 13.81$, $P < .001$), but no interaction between health claim conditions and time of measurement ($F(1,125) = 0.44$, $P = .51$) and package colour conditions and time of measurement ($F(1,125) = 0.01$, $P = 0.93$) on satiety ratings. This indicates that the manipulations of package colour and health claim did not impact satiety ratings through time. No main effect of health claim was observed ($F(1,125) = 0.08$, $P = .78$). Package colour also showed no main ($F(1,125) = 0.02$, $P = .90$) or interactive effects ($F(1,125) = 0.11$, $P = .74$). A significant main effect of time was observed on satiety ratings ($F(1,125) = 13.81$, $P < .001$). Specifically, participants felt more satiated after consumption ($M = 190.8$, $SD = 90.2$) than before ($M = 51.5$, $SD = 19.2$).

4.6 Product perception analysis

Product perception was checked by three scales and four questions.

To test whether the health claims influenced the taste perceptions of chocolate, we conducted an additional ANOVA, which revealed there were no significant differences in the perceived taste of the chocolates across the four conditions and healthiness. In addition, four conditions did not bring different changes of satiety between health claims or package colours. With respect to the other relevant items including weight-gain, participants had similar cognition across different conditions.

However, there was one question that revealed marginally different results across conditions. Participants perceived the green package to be a cheap snack compared with the red package ($M_{\text{green}} = 4.7$, $M_{\text{red}} = 4.2$). The other terms (e.g., “low-fat”, “healthy”, “calorie rich”) did reveal any differences across conditions for the four groups.

Table 9. Participants ‘feeling to taste, healthiness, satiety and gaining weight

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of</i>	<i>Main factor</i>	<i>Interaction</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>(N=32)</i>	<i>(N=32)</i>	<i>claim</i>	<i>of package</i>	<i>effect</i>
						<i>colour</i>	
<i>Delicious</i>	4.8 (1.2)	4.9 (1.1)	5.0 (1.3)	4.8 (1.1)	0.74	0.91	0.55
<i>Satiety</i>	3.5 (1.0)	3.5 (1.1)	3.6 (1.3)	3.6 (1.2)	0.57	0.86	0.98
<i>Gaining weight</i>	5.7 (0.74)	5.6 (0.70)	5.6 (1.0)	5.3 (0.93)	0.16	0.14	0.70
<i>Healthy</i>	2.1 (0.96)	1.8 (0.74)	1.6 (1.2)	1.8 (0.64)	0.14	0.65	0.10
<i>Calorie rich</i>	5.9 (0.89)	5.5 (1.2)	5.6 (1.0)	5.4 (1.0)	0.46	0.10	0.52
<i>Cheap</i>	4.6 (1.6)	4.3 (1.2)	4.7 (1.4)	4.1 (1.3)	0.64	0.07	0.59
<i>Lot fat</i>	5.1 (1.4)	5.0 (1.0)	5.0 (1.6)	4.5 (1.4)	0.20	0.30	0.44

4.7 Emotion analysis

Three types of emotions were analysed, including "positive hedonic", "negative hedonic" and "negative self-conscious". Positive hedonic items presented a significant difference under the main factor of claim (Table 10). We found that the low-fat labelled products were perceived to bring a positive hedonic feeling more often than antioxidant-labelled products ($M_{\text{low-fat}} = 5.2$, $SD_{\text{low-fat}} = 0.10$; $M_{\text{antioxidants}} = 4.9$, $SD_{\text{antioxidants}} = 0.10$) (Figure 7). As to main factor of claim as well as the interaction effect between claim and package colour, the data did not show a significant difference across groups. Similarly, the perception of negative hedonic and negative self-conscious emotions did not differ across the four conditions.

Table 10. Emotion of participants during eating chocolate analysis

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of package colour</i>	<i>Interaction effect</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>(N=32)</i>	<i>(N=32)</i>			
Positive Hedonic	4.9 (0.84)	4.7 (0.91)	5.3 (0.76)	5.1 (0.70)	0.03	0.16	1.0
Negative Hedonic	2.1 (0.75)	2.1 (0.72)	2.0 (0.86)	2.3 (0.90)	1.0	0.20	0.34
Negative Self-conscious	2.6 (1.4)	2.9 (1.4)	2.5 (1.2)	2.7 (1.2)	0.52	0.27	0.95

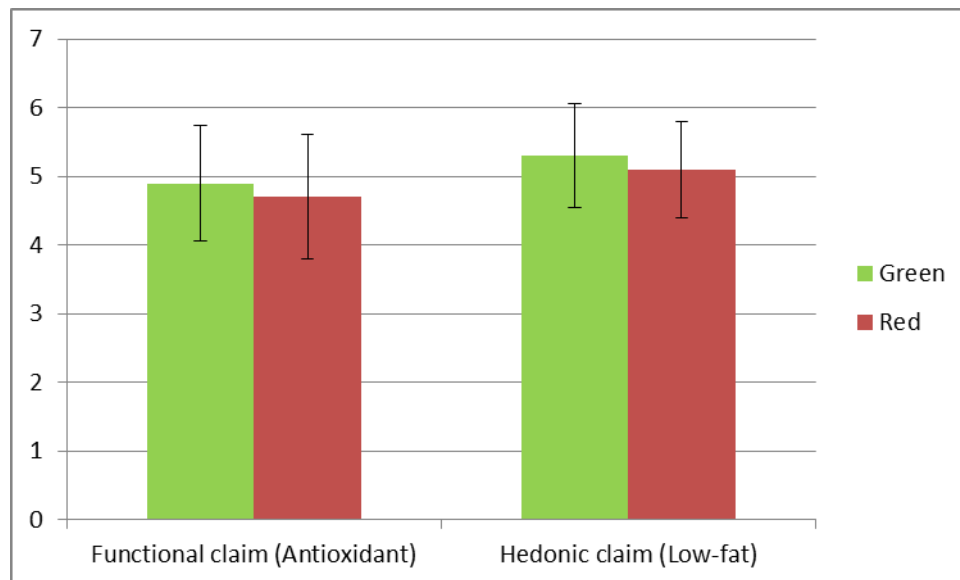


Figure 7. Positive hedonic among four conditions

4.8 Estimate of calories consumed

At the end of this experiment, participants were asked to estimate how many calories they ate. We found no difference among the four conditions for estimated calorie consumption ($F=0.20$, $p=0.66$).

We checked if the discrepancy between the estimated and real calorie consumption differed across conditions. There was no significant difference among the four groups (See Table 11). In other words, the accuracy of participant estimations did not change with claims and package colours.

Table 11. Goal-activation among four conditions

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of package colour</i>	<i>Interaction effect</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>(N=32)</i>	<i>(N=32)</i>			
<i>Estimate of calories</i>	238.8(154.9)	199.8(121.4)	273.5(256.9)	205.3(195.6)			
<i>Difference between estimate and real calories eaten</i>	-62.0(167.4)	-36.1(136.5)	-112.3(241.9)	-79.3(180.4)	0.15	0.37	0.91

4.9 Goal activation measurement

After integrating participant words during a goal-activation process, six types of "worlds" were formulated (Healthy, indulgency, satiety, specific food or related items, colour and others). The frequency of each type was displayed below in table 12. Regarding healthy items, most participants talked about "healthy" in a direct way, for example, "healthy chocolate". With respect to indulgency, participants were likely to say, "Delicious", or "I want to enjoy it". Satiety was indicated by any words about "full" or "hungry". Specific food or related items were those when participants named food or used related words, such as, chocolate, sandwich or vegetables.

However, the activation of indulgence had no significant difference four groups (Table 11).

Table 12. Goal-activation among four conditions

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of package colour</i>	<i>Interaction effect</i>
	<i>N=(33)</i>	<i>N=(33)</i>	<i>(N=32)</i>	<i>(N=32)</i>			
Health-related thoughts	0.79 (0.82)	0.76 (0.52)	0.50 (0.62)	0.69(0.82)	0.19	0.56	0.42
Indulgency-related thoughts	1.2 (1.2)	1.2 (0.87)	1.2 (1.1)	1.0 (1.3)	0.71	0.70	0.81

4.10 Participants' thoughts about the purpose of study

The purpose of this study was to determine if participants ate consciously or unconsciously. There were fourteen participants who discussed how the chocolate would be weighed afterwards. For example, "Onderzoeken hoeveel chocola mensen eten (bewust danwel onbewust tijdens reclame) en kijken wat het verband hiervan is met het feit of mensen aan het lijnen zijn of niet". We found that 89.2% of participants might eat unconsciously during the experiment and the remaining 10.8% might be influenced by their knowledge of the "unconscious" eating of the others. In addition, six participants connected the amount of chocolate consumption with chocolate package (4.6%) among the participants who knew the amount of chocolate that would be measured.

To address the influence of intention upon chocolate consumption, we excluded 14 participants with prior knowledge of the purpose of the study. We found no differences among participants with the smaller, exclusionary dataset across the four conditions (Figure 8, Table 13).

Table 13. The data that excluding the effect of purpose

	<i>Functional claim</i>		<i>Hedonic claim</i>		<i>P-value</i>		
	<i>(Antioxidants)</i>		<i>(Low fat)</i>				
	<i>Green</i>	<i>Red</i>	<i>Green</i>	<i>Red</i>	<i>Main effect of claim</i>	<i>Main factor of package colour</i>	<i>Interaction effect</i>
	<i>N=(28)</i>	<i>N=(30)</i>	<i>(N=29)</i>	<i>(N=28)</i>			
Food consumption	38.1(24.1)	34.5(28.5)	34.3(23.3)	26.7(18.3)	0.19	0.27	0.74
Healthy	0.71(0.71)	0.8(0.81)	0.52(0.63)	0.68(0.86)	0.26	0.39	0.80
Goal-activation							
Indulgency	1.14(1.18)	1.2(0.89)	1.0(1.0)	1.1(1.3)	0.51	0.76	0.97
Goal-activation							
Taste inference	4.8(1.2)	4.8(1.2)	4.9(1.4)	4.7(1.1)	0.91	0.71	0.64
Healthy inference	2.2(1.0)	1.8(0.75)	1.7(1.2)	1.9(0.65)	0.15	0.54	0.12

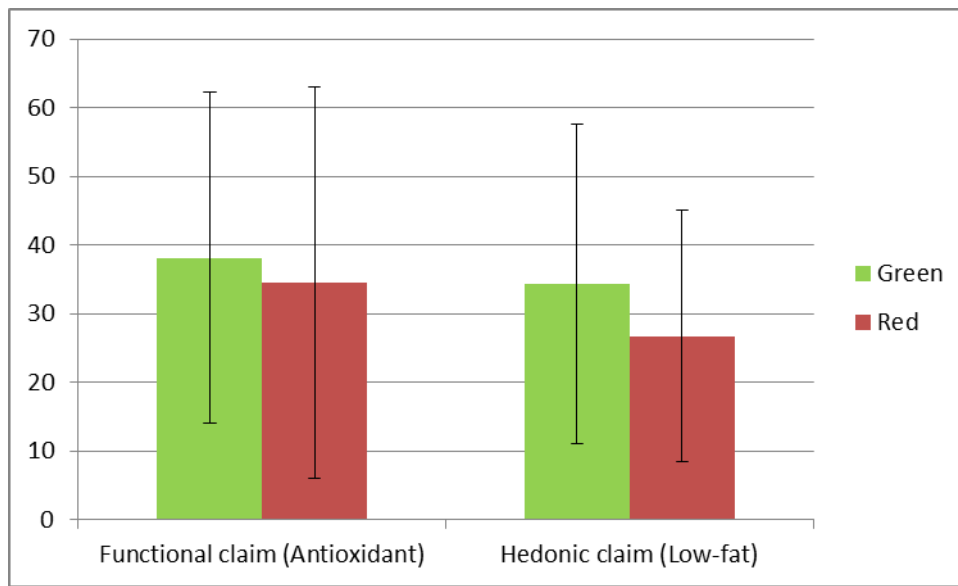


Figure 8. Chocolate consumption as a function of type of health claim and package colour (Participants who correctly guessed the purpose of study were excluded)

5. Discussion

The aim of this study was to determine whether the attributes of health claims on food packages (low-fat claim versus anti-oxidant claim), and package colours (red versus green) could affect food consumption. We found no significant difference in chocolate food consumption for either pair of packaging attributes.

This study was inspired by Belei et al. (2012) who proposed a generalized theory of healthful indulgence, showing when and why consumers change their consumption in response to health claims. In particular, they showed that the nature of the health claim, functional versus hedonic, is the key determinant of consumption effects. Initially, we added a model and assumed that the chocolate consumption could be influenced from two perspectives. The first perspective is a goal-activation process. According to previous research, health or indulgence goals may be activated unconsciously when consumers are in a consumption context. As a result, this could alter the amount of food consumed. The second perspective is a health and taste inference process. Furthermore, satiety, calorie estimates, and the emotion felt during eating might influence chocolate consumption as well.

In our study, we did not observe a clear influence of label health claims upon food consumption as found by Belei et al. Participants who ate chocolate labelled "low-fat" consumed similar amounts compared to those who ate chocolate labelled "antioxidant". Package colour as a cue in consumption context also did not influence the amount of chocolate eaten. In contrast to our expectations, red food packages with a low-fat claim did not lead to the highest food intake among the four conditions. Likewise, a green food package with an antioxidant claim did not result in lower intakes. Namely, our experimental result contradicted the two assumptions. When it comes to the underlying process of this study, health and taste inference did not differ with the diverse combination of two independent variables. In other words, participants have the same health inference and taste inference to different health claims and package colours. From the "goal activation" perspective, it appears that the level of health-goal activation or indulgence-goal activation makes no differences across the four conditions. With respect to the three main emotion scales, only positive emotions were influenced by our experiment differently among the four conditions. Subjects in hedonic groups were happier than those in functional groups.

Judging from the previous studies about health claims, the result is increasingly exact and complex. At first, the views of many consumers have shown that consumer pursuit of healthy food as well as willingness to enjoy food leads to a tendency to choose "healthful" indulgences. This tendency seems to offer a solution to consumer desire to combine a healthy lifestyle with the pleasures of indulging. However, some studies have shown an opposite view, such that a combination of choice for health and indulgence do not benefit consumers (Wansink & Chandon, 2006). These studies show that consumers eat significantly more "healthy" than conventional food because they generalize the benefits associated with such foods. For example, one study found that consumers preferred organic *Kettle*-brand potato chips over conventional potato chips without an organic claim (Palmer, 2008). Wansink and Chandon (2006) showed that labelling food as low fat increases food intake during a single consumption event for both normal- and over-weight people. Our study cannot explain the increase of food consumption because we had no control group.

However, Belei et al. found that the nature of claims on food packages may give different results. However, in our study, participants consumed almost the same amount of chocolate regardless of conditions. In addition, the goal activation results between these two experiments were contradictory. In the Belei study, there were significant differences in health-goal accessibility following exposure to different types of food attributes. Together with no accessible indulgence goals

triggered by the hedonic nature of the food itself, this resulted in no significantly different levels of goal conflict.

In our study, we tested product perception by asking participants to answer questions related to health and taste while tasting the chocolate. We found that their taste and health perception did not differ across the four conditions. However, our study does provide some evidence that functional claims make the chocolate seem less tasty, which was similar with the study of Raghunathan, Naylor, and Hoyer in 2006. More participants judged the red package with a low-fat claim to be attractive, and green packages with an antioxidant claim less attractive.

We also examined participants' emotional state after they tasted the chocolate. Only positive hedonic emotions such as fun and happiness presented a significant difference under the main factor of claim. This result could support primacy of affirmation to some extent. This means that the attributes in a claim rather than their tags (e.g. 'low', 'extra') are processed (Belei, et al., 2012). This explains why hedonic claims (such as low-fat) are processed differently than functional claims and low-fat could bring more positive hedonic emotions than antioxidants. So low-fat products could make the consumer happier to some extent. Otherwise there are not obvious distinctions between groups, such as their estimation of calories, guilt, satiety index and restrained situation.

There are several possible explanations for the differences between our study and that of Belei, et al. We wanted to assess the influence of perceptions of product health and indulgence through a single open-ended question upon participant viewing of chocolate packages. Our intention was to measure what was activated in participants by health claims on the chocolate package and its colour. However, unexpected additional factors may impact the perception of health or indulgence. One of these factors is that participants may have influenced one another because they were not completely isolated during the experiment. Another potential factor is related to "goal-activation". We provided a 20-second period for participants to observe packages. This may unfortunately have long enough to allow participants to switch from a spontaneous, unconscious response state to conscious, non-spontaneous considerations. For example, one participant wrote, "did you have me observe the package like this so I would think that the green package is healthier?" Lauwereyns et al. (2012) studied failures to replicate effects on social and food judgments. They found that a "priming effect" sometimes cannot be shown when the package factor is too weak, which may have been the case with our packaging.

File-drawer problems in science could be another reason for the differences between our study and Belei et al. Publication bias exists, such that the decision to publish a study depends on the statistical significance of its results. It is possible that other studies that found results similar to ours are not published in peer-reviewed scientific literature, giving a skewed picture of reality. Considering previous literature, most of them showed the difference among conditions, which results in differences between my study and the others (Scargle, 2000).

Our study was limited by some additional factors which may have influenced results. First, some participants questioned the purpose of the experiment or material. In other words, they might take their task with a grain of salt. Some participants may have known the real purpose of this experiment because students often participate in similar experiments. However, based on our analysis of the question about purpose, most participants seemed to be unaware of the purpose of the experiment. Second, participants had diverse views on health claims and sometimes they did not believe in them. We found that the antioxidant claim had the least credibility among participants. Thirdly, the participants themselves exhibited highly variable traits, such as differences in the length of eating time, speed of eating, etc. Although we removed the influence of age, BMI, gender, and restrained eating; additional habits also could have had an influence. Furthermore, participants were likely influenced by the taste of the chocolate and not only by the package image. Lastly, we did not

include a control group (the package without health claims), so this study cannot show that health claims have a back -ire effect as we did not compare healthy with conventional foods.

It would be interesting for further research to test our results again to further explore the reasons for the dissimilar findings between our study and Belei et al. Moreover, our study aimed to determine the underlying process by goal activation and consumers' inference. Future research could improve the underlying process or find a new way to research them. Similarly, as to the package colour, further research could test the results to make sure if green could prime health while red could prime indulgency. Furthermore, it would be better to put each participant in a separate room and to reduce the other context as much as possible.

Our findings could provide some suggestions to the food industry and suggest that the nature of attributes emphasized in health claims may have little effect upon consumption. Likewise, the package colour also cannot show any significant effect on consumption. Therefore, food companies should put their energy on the other part that could influence food consumption to increase profit, for example, self-control. For public policy makers, our findings indicate that they should find other ways to help people keep healthy. Although a "low-fat" claim can bring positive emotion, it is not enough to influence food consumption compared with "antioxidant "claims.

In summary, this study explored the effect of health claims on food package and package colour on chocolate consumption and compared results with Belei et al. The two main underlying processes, goal-activation and consumer' perception of products, were used to test participants' inner activities. However, our results on chocolate consumption differed from previous research. This study did not find the attributes of claims or package colour significant influencers of chocolate consumption. Similarly, goal-activation had no difference among four conditions and the inferences of participants were the same among different groups. However, the hedonic emotion did change between low-fat conditions and antioxidant conditions. This indicator was measured after eating chocolate, so its influence on food consumption was not significant, and neither was the estimate of calorie intake and satiety. Our results suggest that further research is needed to better understand this topic and to provide reliable information for food companies and relevant organisations.

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7. Appendix (Questionnaire in Dutch)

Beste deelnemer, Fijn dat je mee wilt doen aan deze studie. Eigenlijk zijn het twee korte studies. In deze

vragenlijst willen we zowel je mening weten over Choco Crunchies en daarnaast over een aantal commercials en dan met name over hun aantrekkelijkheid en humor. Het invullen van alle vragen zal ongeveer 15 minuten duren. Er zijn geen goede of foute antwoorden, wil je invullen wat als eerste bij je opkomt? Als deelnemer aan dit onderzoek blijf je geheel anoniem. Als je allergisch bent voor chocolade kun je niet meedoen met de studie. Verder zijn er geen risico's of voordelen verbonden aan het invullen van de vragenlijst. Je kunt op ieder moment beslissen om te stoppen met invullen.

Door op 'ja' te klikken geef je aan dat je bovenstaande hebt gelezen en ermee instemt:

ja, ik doe mee aan dit onderzoek

1. Hoe hongerig voel je je op dit moment?
2. Hoe vol voel je je op dit moment?
3. Hoeveel denk je nu te kunnen eten?
4. Hoe verzadigd voel je je op dit moment?
5. In hoeverre verlang je nu naar eten?
6. Bekijk rustig deze verpakking voor Choco Crunchies.

Later in deze vragenlijst volgen er vragen over deze verpakking chocolade.



Wij zijn geïnteresseerd in dingen die omhoog komen als mensen denken aan eten. Welke gedachten komen bij je op als je denkt aan eten op dit moment? Schrijf zo veel of weinig gedachten op als je wilt.

1. Eerste gedachte
2. Tweede gedachte
3. Derde gedachte
4. Vierde gedachte
5. Vijfde gedachte
6. Zesde gedachte
7. Zevende gedachte
8. Achtste gedachte

Roep alsjeblieft de onderzoeker. Ga nog niet verder!

Straks volgen een aantal vragen voor de smaaktest. Proef alvast van de chocolade die voor je ligt tijdens het volgende gedeelte van de vragenlijst. Eet gerust zoveel of weinig als je wilt.

Bekijk nogmaals deze verpakking, die je eerder zag in deze vragenlijst.



Geef aan in hoeverre je het eens bent met de volgende beweringen.

	Helemaal mee oneens (1)	Mee oneens (2)	Een beetje mee oneens (3)	Neutraal (4)	Een beetje mee eens (5)	Mee eens (6)	Helemaal mee eens (7)
Het ontwerp van deze verpakking is aantrekkelijk (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De informatie op de voorkant van de verpakking is geloofwaardig (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dit is een mooie verpakking (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choco Crunchies zijn handig verpakt (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze verpakking straalt vitaliteit uit (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nu volgen een aantal vragen over een commercial voor de tweede studie waar we het over hadden. We willen graag weten wat je vindt van deze commercial. Bekijk de commercial rustig en beantwoord daarna de vragen. Als je geen geluid hebt, dan is dit geen probleem, het gaat om de algemene indruk van het filmpje.

Bekijk deze Miele commercial.

Wat zegt de advertentie over het product? Waar in de commercial zie je, hoor je of voel je dat? Licht je antwoord kort toe.

Hieronder staan verschillende concepten of gevoelens. Kies het gevoel of concept dat je het meest associeert met de commercial (slechts 1 keuze maken).

- ☐ iets bereiken en succes hebben (0)
- ☐ een actief en vol leven leiden (1)
- ☐ slimme keuzes maken (2)
- ☐ de vrijheid om jezelf te zijn (3)
- ☐ zelfstandig zijn (4)
- ☐ geaccepteerd worden door anderen (5)
- ☐ voor anderen zorgen, vooral voor de zwakkeren (6)
- ☐ jezelf jong voelen en er jong uitzien (7)
- ☐ persoonlijke zekerheid (8)
- ☐ een goede ouder zijn (9)
- ☐ een betere wereld maken (10)
- ☐ een comfortabel en tevreden leven leiden (11)

De volgende stellingen gaan over de commercial. Geef aan in hoeverre je het met de stelling eens bent.

	helemaal mee oneens (1)	mee oneens (2)	neutraal (3)	mee eens (4)	helemaal mee eens (5)
Dit was een grappige commercial (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik wil minder eten tijdens mijn volgende maaltijd (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het aangeboden product is zeer aantrekkelijk (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze commercial was saai (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bekijk nogmaals deze verpakking, die je eerder zag in deze vragenlijst.



Geef aan in hoeverre je het eens bent met de volgende beweringen.

Deze chocolade

	Helemaal mee oneens (1)	Mee oneens (2)	Een beetje mee oneens (3)	Neutraal (4)	Een beetje mee eens (5)	Mee eens (6)	Helemaal mee eens (7)
ziet er heerlijk uit (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is machtig (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
geeft energie (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bevat veel suiker (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is een verantwoorde keuze (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is een goedkope snack (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is volmakend (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is erg lekker (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bevat veel vet (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Geef aan in hoeverre je het eens bent met de volgende beweringen.

Deze chocolade....

	Helemaal mee oneens (1)	Mee oneens (2)	Een beetje mee oneens (3)	Neutraal (4)	Een beetje mee eens (5)	Mee eens (6)	Helemaal mee eens (7)
is geschikt als lichte snack (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
smaakt heerlijk (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
geeft snel een zeer vol gevoel (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is zeer calorierijk (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
zal voor lange tijd verzadigen (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is dikmakend (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
zal een vol gevoel geven tot aan de volgende maaltijd (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is gezond (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bevat nuttige voedingsstoffen (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Belangrijk: Schrijf nu hieronder de volledige code over die op het gele post-it papiertje staat.

Je bent aan het einde van het eerste deel van het smaakonderzoek gekomen. Roep de onderzoeker. Laat de eventuele overgebleven chocolade liggen. NIETS ETEN OF MEENEMEN, ALSJEBLIEFT! Ga pas verder met de vragenlijst als de onderzoeker bij je is geweest.

Hoeveel calorieën denk je dat je gegeten hebt? Maak een inschatting.

_____ Aantal calorieën: (1)

Hoe voelde jij je tijdens het eten van de chocolade?

	Helemaal mee oneens (1)	Mee oneens (2)	Een beetje mee oneens (3)	Neutraal (4)	Een beetje mee eens (5)	Mee eens (6)	Helemaal mee eens (7)
plezierig (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
teneergeslagen (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gestrest (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ontspannen (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
tevreden (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
boos (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
voldaan (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gefrustreerd (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
blij (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
schuldig (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
schaamte (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
spijt (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
genietend (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

De volgende vraag gaat over hoe je zelf in het leven tegen zaken aankijkt. In welke mate ben je het eens met de volgende stellingen?

	Helemaal mee oneens (1)	Mee oneens (2)	Een beetje mee oneens (3)	Neutraal (4)	Een beetje mee eens (5)	Mee eens (6)
Het werkt altijd beter als vooraf de positieve en negatieve aspecten helder zijn (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Er zijn slechts winnaars en verliezers in deze wereld (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik wil duidelijk onderscheidbaar hebben wat veilig is en wat gevaarlijk (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het werkt beter als dubbelzinnige dingen duidelijk gemaakt worden (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volgens mij kunnen alle mensen onderverdeeld worden in winnaars en verliezers (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informatie moet je zien als ofwel waar of onwaar (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik heb een hekel aan vage meningen (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mensen kunnen helder onderscheiden worden als zijnde 'goed' of 'slecht' (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik wil helder hebben of dingen gunstig voor me zijn of niet (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik wil helder hebben of dingen goed of slecht zijn (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alle vragen hebben hetzij een	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

correct dan wel fout antwoord (11)						
Ik houd ervan om informatie in te delen in de groepen 'waardeloos' of 'nuttig' (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het voelt goed als grenzen duidelijk zijn voor alle dingen (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik beschouw iemand als ofwel mijn vriend of mijn vijand (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het is het beste als competities heldere uitkomsten hebben (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. Hoe hongerig voel je je op dit moment?
2. Hoe vol voel je je op dit moment?
3. Hoeveel denk je nu te kunnen eten?
4. Hoe verzadigd voel je je op dit moment?
5. In hoeverre verlang je nu naar eten?

De volgende vragen gaan over voedingsgedrag. In hoeverre ben je het met de volgende stellingen eens?

	nooit (1)	zelden (2)	soms (3)	vaak (4)	heel vaak (5)
Wanneer je iets zwaarder bent geworden, eet je dan minder dan gewoonlijk? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Probeer je minder te eten tijdens maaltijden dan dat je eigenlijk zou willen? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak weiger je eten of drinken omdat je bang bent dat je zwaarder wordt? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Houd je exact bij wat je eet? (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eet je opzettelijk producten waarvan je afvalt? (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wanneer je teveel hebt gegeten, eet je dan de daarop volgende dagen minder? (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eet je opzettelijk minder om te voorkomen dat je zwaarder wordt? (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak probeer je geen tussendoortjes te nemen omdat je op je gewicht let? (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak probeer je 's avonds niet te eten omdat je op je gewicht let? (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hou je rekening met je gewicht wanneer je eet? (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Lees alsjeblieft de volgende stellingen en beslis hoe waar de stellingen zijn als het gaat om jouw manier van denken van de afgelopen maand.

	Helemaal niet waar voor mij (1)	een beetje waar voor mij (2)	Redelijk waar voor mij (3)	Zeer waar voor mij (4)
Ik denk over voedingsmiddelen als hetzij 'goed', danwel 'slecht' (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk over dingen in 'zwart-wit' termen (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk over mezelf als hetzij goed danwel slecht (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik zie mijn lijnpogingen als ofwel successen of mislukkingen (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk over mijzelf als hetzij 'beheerst' dan wel 'stuurloos' (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Als ik tijdens het lijnen iets eet wat ik eigenlijk niet gepland had, dan vind ik dat ik gefaald heb (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk over mijzelf als hetzij slim dan wel dom (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tijdens het lijnen zie ik mijn eetgedrag als ofwel goed of slecht (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Met andere mensen kan ik ofwel goed opschieten of helemaal niet (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ik zie er ofwel aantrekkelijk uit of lelijk (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk over mijzelf als iemand die dingen zeer goed of zeer slecht uitvoert (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Ben je op dit moment aan het lijnen?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Helemaal niet:Heel erg (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Wat is je geslacht? Man (1) Vrouw (2)

Wat is je lengte in centimeters? _____ Lengte (1)

Wat is je leeftijd in jaren? _____ Leeftijd (1)

Wat is je gewicht in kilo's? _____ Gewicht (1)

Wat denk jij dat het doel van deze studie is?

Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij op zoek zijn naar deelnemers. Mogen wij je hiervoor af en toe (maximaal 1 keer per maand) benaderen per e-mail? Zo ja, schrijf hieronder je e-mailadres (alleen als je nog niet in bestand staat, niet-wur adres is ook ok):

Hartelijk dank voor je deelname aan het onderzoek! Klik op het pijltje naar rechts om de vragenlijst in te sturen.