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Spicy curry with delicious vegetables: can indulgent framing encourage healthy eating in the Netherlands?

Bachelor thesis

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Abstract

Previous studies showed the increase of obese patients in Western civilisations, including in the Netherlands. One reason that could explain the increase of obese patients is the intuition of unhealthy food being considered tastier, while people think healthy food to be less tasty. While Americans were shown to believe this inverse relationship between the healthiness and the tastiness, in France this relation was shown not to work inversely but positively. The existing research suggests culture may play a role, however, the results are conflicting and, for that reason, cannot be generalised to other countries. Therefore, in this experiment, the Netherlands will be investigated to see whether language can be used to influence the perceptions of tastiness and the purchase intention of healthy food. In this study, 191 participants rated three healthy and three unhealthy food advertisements accompanied with a description, focussing on the taste or the healthiness. Dutch people were shown to perceive unhealthy food as tastier, but did not necessarily have a higher purchase intention for unhealthy food. Food descriptions did not alter either variable. The results suggest that taste-focussed descriptions do not improve perceptions of tastiness and purchase intention of healthy food in the Netherlands.

Keywords: *healthiness, framing, tastiness, purchase intention, Netherlands*

Introduction

From the 1960s onwards, the percentage of obese patients in the United States showed a significant upward trend (Flegal, Carroll, Kuczmarski & Johnson, 1998). To put in perspective, the number of patients of this disease of prosperity in the United States has more than doubled from 1976-1980 (15%) to 2007-2008 (36%) amongst adults, and more than trebled (from 5% to 17%) in the same period amongst children and adolescents (Flegal, Carroll, Ogden & Curtin, 2010; Levy-Navarro, 2008; Ogden, Carroll, Curtin, Lamb & Flegal, 2010). Whereas a considerable number of people inherited it genetically, a second group of people obtained this excess weight due to an unhealthy life style, that is to say, a disequilibrium between one's energetic intake and his or her energetic output (e.g. Aspillaga et al., 2012; Boichat, 2014). This unhealthy life style is partially caused by a intuition that people possess with regard to the healthiness and the tastiness of a dish. Namely, consumers tend to perceive these two attributes as conflicting (Keller, Sternthal & Tybout, 2002; Nørgaard & Brunsø, 2009). The disadvantage, however, is the fact that the taste of a dish has the highest influence in the moment of making a food choice (e.g. Luomala et al., 2005; Norton, Falciglia & Ricketts, 2000; Pinto et al., 2017). In other words, when one can choose between the healthiness and the tastiness of a dish, the

pleasure of the dish appears in these circumstances to take the first position (Magee & Hennessy-Priest, 2004; Raghunathan, Naylor & Hoyer, 2006).

With taste being the most important influencer in food choices, the importance of healthiness as a factor decreases. Since food choices affect one's health, mortality and morbidity over time (Shepherd & Raats, 2006), encouraging healthy eating is necessary. However, given that people subconsciously prefer tasty dishes over healthy meals (Raghunathan et al., 2006), the choice for unhealthy food is oftentimes preferred over healthy food. Modifying these subconscious beliefs is a difficult process since these are deeply rooted in one's way of thinking. For that reason, nudging people into choosing healthy dishes on the moment of making such a food choice is essential. In the last two decades, the upcoming of the online food ordering sector was clearly visible, where more and more restaurants started selling their meals via online food ordering platforms (Jiang, Wang, Jin & Delgado, 2019). Given that these food ordering companies offer meals that are prepared in restaurants, the dishes are, like in restaurants, less nutritious and richer in calories. Consequently, an increased amount of restaurant eating, including via online food ordering platforms, has been associated with health problems and the rising number of obese patients (Hallak, Lee & Onur, 2019; Wellard, Glasson & Chapman, 2012).

For this reason, online food ordering companies should attempt to encourage a healthy nutrition pattern. This could be realised by promoting healthy dishes. However, offering appealing and acceptable alternatives for these unhealthy but tasty dishes has shown to be a complex process (Newson, Van der Maas, Beijersbergen, Carlson & Rosenbloom, 2015). Therefore, getting more insight on how other manners, for example food descriptions, can stimulate diners to select healthier food options is required. Given the intercultural differences in food choices, this study will focus on healthy food choices in one specific country, the Netherlands. This study elaborates on the existent body of research on healthy and unhealthy food by studying how language can play a role in food choices, amongst Dutch consumers, to promote healthy eating. In this study, the research question is to what extent healthy eating can be encouraged if food descriptions would focus on the tastiness of the dish, instead of using descriptions that focus on the healthiness.

However, the healthiness and the tastiness of the food appear to be more than two merely 'conflicting' influencers in food choices. Multiple studies have provided evidence that there is an inverse relationship between these two variables (e.g. Bialkova, Sasse & Fenko, 2016; Fenko, Kersten and Bialkova, 2016; Verbeke, 2006; Wansink & Chan, 2001). To be concrete, people generally consider healthy food as virtuous but less tasty, while unhealthy food is

perceived as pleasurable with, in fact, a high degree of tastiness (Charles & Kerr, 1988; Thomsen & Hansen, 2015). Consumers even believe that increasing the healthiness of a meal can only be realised by sacrificing part of the taste (Bialkova, Gunert & Van Trijp, 2013).

A study by Raghunathan et al. (2006) researched the existence of this inverse relationship between the healthiness and tastiness. They showed that, even if people share the same dish, those that had a label which described that it was an unhealthy meal indicated the dish to be tastier and more enjoyable than these participants whose label indicated that the food was healthy. In other words, Americans generally consider unhealthy food to be tastier and, inversely, healthy food to be less tasty. This is the so-called 'Unhealthy = Tasty Intuition'. In their study, they additionally showed that this relationship was present by those who indicated that they did not consider unhealthy food to be tastier, implying this intuition can operate subconsciously. This perception was also demonstrated to work in the opposite direction, with tastier food being perceived as less healthy and less tasty food being perceived as healthier (Hur & Jang, 2015).

However, multiple researchers have not merely suggested (Fischler & Masson, 2008; Rozin, Fischler, Imada, Sarubin & Wrzesniewski, 1999) but also provided evidence (Jo, Lusk, Muller & Ruffieux, 2016; Jo & Lusk, 2018; Werle, Trendel & Ardito, 2013) in support of the existence of intercultural differences with regard to food choices, even between European countries (Roininen et al., 2001; Gracia & Albisu, 2001). That implies that the American results cannot be directly translated to other countries. However, a somewhat similar study in the Netherlands discovered already that, like the Raghunathan et al. (2006) study, unhealthy food is perceived as tastier than healthy food (Fenko et al., 2016). Given that this study will also be performed in the Netherlands, it will be assumed that the outcome will be comparable. Therefore, it is hypothesised that:

H1: Unhealthy food is seen as more tasty than healthy food amongst Dutch consumers.

Different studies in the United States have also demonstrated that the Unhealthy = Tasty intuition works through to one's consumer behaviour. That is to say, since taste is generally considered to be a more influential factor in making food choices, Americans tend to prefer selecting an unhealthy meal over a healthy meal because they perceive that as tastier (Magee & Hennessy-Priest, 2004; Raghunathan et al., 2006). It would be evident that this preference for tasty food would then be translated to the purchase intention. Given that the Dutch also appear

to perceive unhealthy food as tastier than healthy food, unhealthy food presumably leads to a higher purchase intention among Dutch consumers. Therefore, it is suspected that:

H2: Unhealthy food leads to a higher purchase intention than healthy food amongst Dutch consumers

As described above, taste is the biggest food choice influencer. The problem, however, is that the preference for tasty food is indirectly translated to the overconsumption of unhealthy food. Given the difficulty of mitigating the importance of the tastiness of the food at the moment of making a food choice, many marketers have attempted to concentrate on other aspects influencing food choices to encourage healthy eating (Bialkova et al., 2016; Verbeke, 2006). A number of other factors including satiety (Köster, 2009; Newson et al., 2015), price (Pachucki, 2014), affective benefits (Dean, Raats, & Shepherd, 2008; Verhoef, 2005), consumption context (Cardello & Schutz, 1996; King, Weber, Meiselman & Lv, 2004; Meiselman, 2007) and personal norms (Raats, Shepherd, & Sparks, 1995; Thøgersen, 1999) have also shown to affect the consumer's food choice.

Another factor that may influence one's food choice is language. One attribute of language that has been investigated specifically is framing. Framing is the process of formulating a sentence in such a manner that some facets of a certain issue or event are accentuated (Entman, 2004:5; Tversky & Kahneman, 1981: 453). Framing in the food choice domain has mostly emphasised the healthiness (health-related frame) and tastiness (indulgent frame). Healthy frames (e.g. *vitamin-rich curry with fresh vegetables*) are oftentimes used for healthy food and indulgent frames (e.g. *spicy curry with premium vegetables*) for unhealthy food. Evidently, dishes using an indulgent frame are assessed as tastier, and dishes with a health-related frame as healthier (Bialkova et al., 2016; Grabenhorst, Schulte, Maderwald & Brand, 2013).

However, the issue with health-related frames is that these appear not to work, or even worse, they seem to work counterproductively. Studies have shown that consumers rate dishes with health-related frames as less tasty (Raghunathan et al., 2006), less appealing (Fenko et al., 2016; Lähteenmäki et al., 2010) and less filling (Finkelstein & Fishbach, 2010; Suher, Raghunathan & Hoyer, 2016). Since people appear to have these negative attitudes and experiences, spotlighting the healthiness of healthy food by using health-related terms can cause people even to be less likely to adopt healthier behaviours. Using indulgent language for healthy dishes could therefore be a possibility to encourage healthy eating.

Fenko et al. (2016) conducted an experiment to see how using a hedonic (focussing on taste and satisfaction) or healthy label could affect the tastiness and purchase intention of healthy (apple juice) and unhealthy food (chocolate cookie) amongst Dutch consumers. For the healthy label they chose a well-known Dutch quality mark by the name of *Bewuste Keuze* (translation: conscious choice), which frequently appears on Dutch packaging, and for the hedonic label a less known quality mark by the name of *Puur genieten* (translation: pure enjoyment), which appears sporadically on Dutch packaging. However, only for the chocolate cookie the hedonic label received a significantly higher purchase intention and tastiness rating compared to the healthy label, and not for the apple juice. This was partially caused by the fact that the participants were to a considerably higher degree familiar with the healthy label (95%) compared to the hedonic label (13%). Consequently, participants were sceptical about the hedonic label for the apple juice causing the tastiness to be rated lower, and therefore likewise the purchase intention. Hence, no significant differences were found for apple juice. However, since the participants were suspicious about the fact that an unhealthy food item (cookie) contained a healthy label and since the hedonic label matched the cookie better, participants distrusted the healthy label more than the hedonic label. Therefore, the tastiness and purchase intention for the cookie with the indulgent label was significantly higher.

A study by Turnwald and Crum (2019) investigated descriptions instead of quality marks and also included dishes instead of basic food items. They researched to what extent taste-related frames could be used on healthy meals to promote healthy eating. They showed that (1) Americans selected healthy food (vegetables, salads, vegetable wraps) more often when accompanied by an indulgent frame than by a health-related frame, and (2) that the post-consumption ratings of tastiness were considerably higher for these dishes with an indulgent frame compared to those with a health-related frame. Moreover, in their study, language was shown to improve perceptions about healthy food and the possibility to adopt healthier behaviours. Nevertheless, this study only investigated Americans and it is questionable to what extent these results are generalisable to other cultures. In addition, in this study the context is different, since here social media posts will be focussed on instead of real restaurant settings. Furthermore, they evaluated how healthy purchases would persist over time by comparing vegetarian food with meat. In contrast, this study investigates purchase intention only at the first sight, since otherwise prior experiences may exert an influence in food choices. In last place, this study presents a more expanded range of different healthy and unhealthy dishes, so that the results are more generalisable to both populations. Therefore, it is questionable whether the results of their research can be fully translated to this study.

Whereas previous studies have focussed on using either indulgent or healthy frames, food descriptions do not always focus on taste or on the healthiness of the food. In a study by Turnwald, Jurafsky, Conner and Crum (2017) 26 American restaurant menus were examined in which they discovered more than 20 different types of food descriptions, with several utilised more in healthy menus and others more in standard menus where unhealthy food is included. They discovered that healthy menus are often advertised with healthy-themed words such as *fat-free*, *low-carb*, *fresh* and *plain*, while food in standard menus is described as *crunchy*, *crispy*, *flavourful* and *mouth-watering*, and therefore it is not strange that healthy food is generally seen as less tasty. However, they also discovered that some descriptions were used similarly in both menus, including words such as *amazing*, *giant*, or concepts like *freedom of choice* and *family*. These are called ‘neutral’ in this study, and will be used as a control variable.

As mentioned before, due to the ‘Unhealthy = Tasty intuition’, indulgently framed healthy food is not expected to reach the same level of expected tastiness of indulgently framed unhealthy food. However, compared to healthily framed healthy food, the expected tastiness of indulgently framed healthy food should be significantly higher, since consumers rated dishes with health-related frames as less tasty (Raghunathan et al., 2006). Neutrally framed healthy food probably does not have the great negative association that healthily framed healthy food has but also not the same expected tastiness as the indulgently framed healthy food, which leads to the following hypothesis:

H3: Indulgently framed healthy food leads to a higher expected tastiness than neutrally framed healthy food, which, again, leads to a higher expected tastiness than healthily framed healthy food

Apart from choosing either a healthy or tasty food item, research has discovered that another method can be applied when being faced with the ‘conflicting’ choice between healthiness and tastiness, which is bundling. Bundling is a strategy to compensate, in this specific case, the enjoyment of tasty food with the healthiness of healthy food (Chandon & Wansink, 2007). Even though tastiness remains the predominant factor in food choices, an indulgently framed healthy dish has the additional benefit of a healthiness connotation when people consider the dish to be healthy (e.g. a salad will always have the connotation of being healthy even when the frame is taste-focussed), whereas indulgently framed unhealthy food merely attempts to persuade on the basis of the tastiness of the dish.

Since unhealthy food is considered to be tastier than healthy food (H1), likewise, indulgently framed unhealthy food will probably be perceived as tastier than indulgently framed healthy food. Therefore there is no reason to suspect any deviations with regard to the tastiness in this respect.

However, bundling can also be related to the variable purchase intention. On the basis of the principles of bundling indulgently framed healthy food might be considered as a better purchase than indulgently framed unhealthy food given that it has both the taste (because of the indulgent frame) and the healthiness. This could suggest that there is an interaction effect between the healthiness of the food and the type of frame. Consequently, it is speculated that:

H4: Indulgently framed healthy food leads to a higher purchase intention than indulgently framed unhealthy food

In addition, indulgently framed healthy food – also because of the bundling strategy – will probably reach a higher purchase intention than healthily and neutrally framed healthy food, since taste is the most important food choice influencer. Even though the expected taste is predicted to be lower for healthy food, the healthiness of the food is also seen as a valid reason to choose the food, and for minorities even more important than taste (Campos, Doxey & Hammond, 2011; Chen, Jahns, Gittelsohn & Wang, 2012; Hawkes et al., 2015). Therefore, it is suggested that healthily framed healthy food leads to a higher purchase intention than neutral food. In other words, it is hypothesised that:

H5: Healthily framed healthy food leads to a higher purchase intention than neutrally framed healthy food, but a lower purchase intention than indulgently framed healthy food among Dutch consumers.

Methodology

Materials

In this study there are two independent variables, the type of language frame (3 levels: healthy, indulgent and neutral) and the level of healthiness of the dish (2 levels: healthy and unhealthy). For the variable ‘healthiness’, three unhealthy (pizza, hamburger and nachos) and three healthy dishes (salad, salmon, vegetable curry) were selected, in order to allow the results to be more generalisable to both populations. Each of these meals was represented by a certain picture (see appendix 1) and a type of frame.

In the questionnaire, the images were accompanied by a healthy frame, indulgent frame, or neutral frame. A healthy frame is a type of frame in which the healthy aspects of the dish are emphasised, for instance: *Vitaminerijke curry met verse groentes* (translation: vitamin-rich curry with fresh vegetables). In an indulgent frame, however, the taste of the dish is accentuated, of which the following phrase is an example: *Pittige curry met premium groentes* (translation: spicy curry with premium vegetables). A neutral frame, in contrast, does not spotlight one of these aspects. Instead, a neutral frame concentrates on those aspects which are already visible in the image or concepts as variety or freedom of choice, for example: *Geweldige curry met verschillende groenten* (translation: Amazing curry with various vegetables). The words that were used in these examples and likewise in the frames for the other dishes are based on a study by Turnwald et al. (2017). Since the questionnaire was focussed on Dutch consumers, the questionnaire was in Dutch. Therefore, some words had to be edited slightly to suit the examples. It was attempted to maintain the sentence comparable to reduce possible noise.

In the questionnaire there were three different groups. These groups all saw the same images and meals, however each accompanied with another frame. For example, the first group of respondents observed the six dishes of which two utilised a healthy frame (pizza and salad), two an indulgent frame (hamburger and vegetable curry), and two a neutral frame (nachos and salmon), whereas the second group saw the same images although, for instance, the pizza and salad with indulgent frames, and the hamburger and vegetable curry with neutral frames.

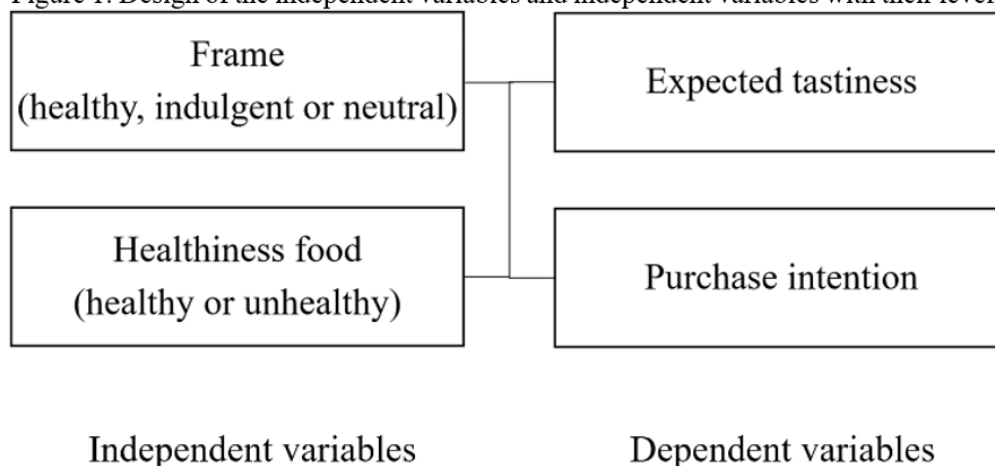
Since this study focussed on online platforms, all images were presented as coming from a made up restaurant by the name Dinery who posts photos of their dishes on Instagram (Instagram name is *restaurantdinery*). Therefore, these images were edited in an Instagram format. After each image, six questions were asked to investigate the effect of the independent variables on the dependent variables. Several of these questions were based on a study about which more explanation is given in the section *Instruments*. The online experiment was distributed through social media.

Subjects

In total 192 participants filled in the study. One of these was under the restricted age and therefore these answers were deleted. From the 191 other participants, 91 were male (47.6%), and 100 were female (52.4%). The mean age was 29.52 years ($SD = 14.32$). With regard to the professional status, 106 respondents were students (18.5%), 77 were workers (40.3%), and 8 filled in the option 'other' (1.4%). For those who were still studying, 56 participants had the university bachelor as their current education (52.8%), with answers ranging from pre-

university education (vwo) to a university master. For those who were working or filled in ‘other’, the bachelor of higher professional education (hbo) was opted most often (35 respondents, 41.2%). Here the answers ranged from intermediate preparatory vocational education (vmbo) to university master.

Figure 1: Design of the independent variables and independent variables with their levels



Design

In this study a 3 (type of frame) x 2 (healthiness food) within-subjects design was used (see figure 1). Participants were assigned to three different groups and each group observed the same six images combined with either of the three types of language frames (neutral, healthy and indulgent). The three different groups of respondents all rated these dishes with their specific frames for both healthy and unhealthy food.

Instruments

Expected tastiness was measured based on a seven-point semantic differential scale. The participants assessed how the meal looked like with answers ranging from (1) *helemaal niet smakelijk* (translation: not tasty at all) to (7) *zeer smakelijk* (translation: very tasty); (1) *helemaal niet aantrekkelijk* (translation: not appealing at all) to (7) *zeer aantrekkelijk* (translation: very appealing); and (1) *helemaal niet lekker* (translation: not delicious at all) to (7) *zeer lekker* (translation: very delicious). The second dependent variable (purchase intention) was measured based on a seven-point semantic differential scale as used by Prendergast, Tsang, and Chan (2010). Participants indicated if they would choose the meal in a restaurant on the basis of three inverse adjectives: ((1) *zeer onwaarschijnlijk* (translation: very improbable) to (7) *zeer waarschijnlijk* (translation: very probable); (1) *zeer onaannemelijk* (translation: very unlikely) to (7) *zeer aannemelijk* (translation: very likely); and (1) *zeer onmogelijk* (translation: very impossible) to (7) *zeer mogelijk* (translation: very possible)).

Apart from the two dependent variables, the participant's appetite and ad credibility were operationalised, since it was found that appetite (Yeomans, 2007) and ad credibility (Bouhlef, Mzoughi, Ghachem & Negra, 2010; Pornpitakpan, 2004) can exert an influence on food choices. Appetite (from now on: hunger level) was measured by two questions. The first question was measured based on a 7-point semantic differential scale, asking the participants to rate their current hunger level ranging from (1) *helemaal geen trek* (translation: no appetite at all) to (7) *veel trek* (translation: a lot of appetite). The second question was an open question asking when the participants ate their last meal.

In addition, the credibility and persuasion (together: credibility) of the images was measured based on a 7-point Likert scale. The respondents answered whether they thought the image looked *overtuigend* (translation: persuasive) and *geloofwaardig* (translation: credible) (both (1) completely disagree – (7) completely agree). These two questions were added because the credibility of the advertisements could influence the attitude towards them, what may influence perceptions of tastiness and purchase intention.

Procedure

To conduct this experiment, an online questionnaire was created by means of the website Qualtrics. The online questionnaire started with a small introduction about the experiment and some further instructions. The participants were randomly assigned to one of the three groups.

After the introduction, a few demographical questions, such as gender, age, working status and educational level were asked. Subsequently, two questions were asked with regard to their hunger level at the moment of filling in the questionnaire. Next, participants were presented with an image of a dish accompanied with one of the three frames, followed by the questions as explained in the *Instruments* section. This process was repeated, until the participant had seen all six dishes and filled in all questions pertaining to the tastiness and purchase intention of these dishes. These meals appeared in a randomised order in the survey. In addition, for other research purposes a number of questions were included with regard to the health orientation of the participants and the expected reward of choosing this dish. These questions did not play a role in this study. After these questions, the respondents were thanked for participating in this study.

Statistical treatment

To investigate the main and interaction effects of the healthiness of the food and of the different frames on expected taste and purchase intention, two two-way repeated measures analyses of variance were conducted. Hereafter, to examine whether hunger level influences the tastiness

and purchase intention scores of these independent variables, two two-way repeated measures analyses of covariance were performed with hunger level as the co-variate variable. In addition, to measure the credibility of the advertisements, a one-way analysis of variance was conducted.

Results

First the inter-item reliability of the two independent variables and the credibility was checked. The inter-item reliability for tastiness, consisting of 3 levels (tasty, appealing, delicious) was very good ($\alpha = 0.97$). The inter-item reliability for purchase intention, consisting of 3 levels (probable, likely, possible) was also very good ($\alpha = 0.96$). The inter-item reliability for credibility consisting of two items (persuasive, credible) was good ($\alpha = 0.90$).

Subsequently, to measure whether Dutch people find unhealthy food tastier, a two-way analysis of variance was conducted. A repeated measures analysis for expected tastiness with type of description (3 levels: neutral, healthy, and indulgent) and healthiness of the meal (2 levels: healthy and unhealthy) showed a significant main effect of healthiness of the food on the expected tastiness ($F(1, 190) = 5.23, p = .023, \eta_p^2 = .027$). Unhealthy food was perceived as tastier ($M = 5.08, SD = 1.45$) than healthy food ($M = 4.86, SD = 1.48$). However, this repeated measures analysis did not show any main effects for the type of description ($F(1, 190) = 2.78, p = .064, \eta_p^2 = .014$), nor any interaction effect between type of description and healthiness of the meal on the tastiness ($F(1, 190) = 2.11, p = .166, \eta_p^2 = .011$).

Next, a repeated measures analysis of covariance was performed with type of description and healthiness of the meal as main variables and hunger level as a co-variate factor. Hunger level was shown to significantly influence the tastiness scores for the type of food ($F(1, 190) = 5.88, p = .016, \eta_p^2 = .030$), although was not shown to influence the tastiness scores for the type of label ($F(1, 190) < 1, \eta_p^2 = .005$) nor influence the tastiness scores for the interaction effect between the type of frame and the type of food ($F(1, 190) < 1, \eta_p^2 = .002$). To discover whether the tastiness scores between healthy and unhealthy food were significantly different for people with low hunger level or high hunger level, the participants were divided in two groups. Since the median was 4, it was decided that the participants that filled in 1 to 3 belonged to the low hunger level group, and the participants that filled in 4 to 7 belonged to the group with high hunger level. Hereafter, a paired samples *t*-test was conducted. A paired samples *t*-test did not show a significant difference between the tastiness scores for unhealthy and healthy food for participants with low hunger level ($t(80) = .009, p = .993$). However, a paired samples *t*-test to tastiness scores for participants with a high hunger level did show a significant difference between healthy and unhealthy food ($t(109) = 3.254, p = .002$). Amongst

participants with a high hunger level, the tastiness scores for unhealthy food were higher ($M = 5.28, SD = .93$) than for healthy food ($M = 4.89, SD = 1.07$).

Table 1: The means and standard deviations (between brackets) for the tastiness of the healthy and unhealthy dishes with the three types of frames (1 = very negative, 7 = very positive)

	Healthiness of the food	
	Unhealthy food	Healthy food
	n = 191 $M (SD)$	n = 191 $M (SD)$
Healthy frame	5.02 (1.48)	5.00 (1.46)
Indulgent frame	5.18 (1.40)	4.92 (1.47)
Neutral frame	5.05 (1.46)	4.66 (1.52)

Next, a repeated measures analysis for purchase intention with type of description (3 levels: neutral, healthy, and indulgent) and healthiness of the meal (2 levels: healthy and unhealthy) showed no significant main effect of healthiness of the food on the purchase intention ($F(1, 190) = 3.87, p = .051, \eta_p^2 = .020$), although definitely a trend could be perceived were the purchase intention for unhealthy food was higher than for healthy food. The repeated measures analysis of variance also did not show any main effects for the type of description ($F(1, 190) = 1.80, p = .060, \eta_p^2 = .029$), even though there was a trend for values to be lower with the neutral description. The interaction effect between type of frame and healthiness of the meal for purchase intention was also not shown to be significant ($F(1, 190) = 1.80, p = .593, \eta_p^2 = .006$).

Hereafter, the effects of hunger level were again added as a co-variate factor. Hunger level was shown to significantly influence the purchase intention scores for the type of food ($F(1, 190) = 4.28, p = .040, \eta_p^2 = .022$), but was not shown to influence the purchase intention scores for the type of label ($F(1, 190) < 1, \eta_p^2 = .009$) nor influence the purchase intention scores for the interaction effect between the type of frame and the type of food ($F(1, 190) < 1, \eta_p^2 = .010$). Subsequently, a paired samples t -test was performed to investigate if there are any differences between people with low hunger level (1-3) and high hunger level (4-7). A paired samples t -test did not show a significant difference between the purchase intention scores for unhealthy and healthy food for participants with low hunger level ($t(80) = .007, p = .994$). However, a paired samples t -test did show a significant difference between the purchase intention scores for unhealthy and healthy food for participants with high hunger level ($t(109)$

= 2.578, $p = .011$). Amongst participants with a high hunger level, the purchase intention scores for unhealthy food were higher ($M = 4.68$, $SD = 1.18$) than for healthy food ($M = 4.23$, $SD = 1.29$).

Since the advertisements were not real, the credibility of the advertisements was also measured. A one-way analysis of variance measuring the credibility of the advertisements of indulgent, healthy and neutral frames did not show any significant difference ($F(2, 400) = 2.174$, $p = .125$). However, an independent samples t -test measuring credibility of the advertisements between healthy and unhealthy food did show a significant difference ($t(378.535) = 3.537$, $p < .001$). Strangely, the advertisements of the healthy dishes ($M = 5.13$, $SD = .89$) were seen as more credible than those for the unhealthy dishes ($M = 4.79$, $SD = .95$).

Table 2: The means and standard deviations (between brackets) for the purchase intention of the healthy and unhealthy dishes with the three types of frames (1 = very negative, 7 = very positive)

	Healthiness of the food	
	Unhealthy food	Healthy food
	n = 191	n = 191
	$M (SD)$	$M (SD)$
Healthy frame	4.45 (1.71)	4.31 (1.82)
Indulgent frame	4.56 (1.73)	4.28 (1.83)
Neutral frame	4.35 (1.76)	3.99 (1.85)

Conclusion

This study investigated perceptions of Dutch people towards healthy and unhealthy food and the effect that frames can play in changing these perceptions. The results of this study are in line with results from other Dutch studies (Fenko et al., 2016), by showing that in the Netherlands the Unhealthy = Tasty Intuition is predominant, as it is in the United States (Raghunathan et al., 2006). This shows that the inverse relationship between the healthiness and the tastiness of the food also seems to be prevalent in the Netherlands. One factor that explained the differences between how tasty one finds healthy and unhealthy food is hunger level. Participants with a high hunger level considered unhealthy food as tastier than healthy food, whereas this difference was not found for respondents with a low hunger level.

The effect of the healthiness of the food on the purchase intention was not significant, however most certainly a trend can be perceived, in which unhealthy food seems to attract a

higher purchase intention. That trend would be in consonance with a large number of studies that state that taste is the predominant influencer in food choices and suggests that the Dutch tend to value taste (pleasure-oriented) more than the healthiness, as claimed by Roininen et al. (2001). One factor that played a role in this trend was hunger level. Respondents with a high hunger level had a higher purchase intention for unhealthy food than for healthy food, whereas those with a low hunger level did not have this.

Since indulgent labels had already shown to have a significant higher purchase intention and tastiness for unhealthy food (Fenko et al., 2016), it was suggested that the same results were more pronounced for descriptions, given that descriptions tend to be more effective than labels when it comes to healthy eating (Cadario & Chandon, 2019). However, in this study the health-related and indulgent frames did not show to influence this process. Even though both for the expected tastiness and the purchase intention the type of description was again near to significance, this was only compared to neutral framing; scores for healthy and indulgent frames were very similar. These descriptions or frames also did not interact with the healthiness of the dish, meaning that the theory of bundling, that is to say, choosing a dish that compensates for the healthiness and the tastiness, was not proven to exert a significant influence.

Discussion

In this study, we were interested in investigating whether different kinds of framing could be used to encourage healthy eating. The first type of frame focussed on healthiness (healthy frame), the second on tastiness (indulgent frame), and the third one on other aspects, for instance, freedom of choice or family (neutral frame). However, even though it was hypothesised that indulgent framing would score highest on tastiness and purchase intention for healthy food, the results do not support this hypothesis. Without being significant, the differences in the means indicate a certain trend that the tastiness was rated higher for the healthy and indulgent frames compared to the neutral frames, while the scores for healthy and indulgent frames were very similar. Nevertheless, the outcome is not highly remarkable. Even though the taste of the food is the predominant influencer in food choices, the healthiness is the second most important influencer, and, therefore, it is not necessarily strange that no differences were found for the purchase intention between healthy and indulgent frames. However, probably another factor is involved that might have influenced the ratings for not only purchase intention, but including tastiness. A possible reason could be that the ‘nutrition-conscious’ participants, who find healthy food tastier and prefer purchasing healthy food, are more affected by the description under the image. Studies have shown that unhealthy eaters are seeking more

to sensory gratification than healthy eaters (Swenson & Walls, 1995), and that healthy eaters are more open to information about health (Dutta-Bergman, 2004). That could imply that unhealthy eaters read the frame but formed their opinion more on the image, whereas healthy eaters were more influenced by the type of frame. A possible explanation might be that the frames impacted the bigger group of ‘unhealthy eaters’ subtly, although the impact of the frame is stronger for the smaller group of people who prefer healthy food over unhealthy food. Perhaps, for that reason, no significant differences could be found. Nevertheless, future research needs to discover whether the effectiveness of framing with respect to nutrition is influenced by the type of eater (healthy or unhealthy), and whether to encourage healthy eating, different framing methods could be implemented that conform to the various types of eaters.

Furthermore, this study investigated whether Dutch people perceived unhealthy food as tastier than healthy food, like Americans. The results imply that consumers, if they want to eat tasty, they tend to choose unhealthier options over healthier options. This is in contrast with the evolutionary point of view, where taste was positively correlated with healthiness, since the hunters and gatherers used taste to recognise nutritious food items (Breslin, 2013). The reversal of the relationship between healthiness and tastiness can be explained by the effort of unhealthy food companies’ marketers. These marketers directed unhealthy food commercials towards children with appeal themes as taste, action-adventure, fun, humour and fantasy, which directly affect children’s nutrition knowledge, purchase behaviour, consumption patterns and preferences (Cairns, Angus, Hastings & Caraher, 2013). Given that children do not comprehend the intention of advertising, they are more vulnerable to it, and, thus, accept it faster (e.g. Bandyopadhyay, Kindra & Sharp, 2001). And once they have adopted that unhealthy food is tastier, it is difficult to change these behaviours (Ricci, Banterle & Stranieri, 2018). Consequently, when children grow up they still consider unhealthy food to be tastier. In other words, due to successfully targeting young children, marketers of unhealthy food companies have accomplished that the positive relation between healthiness and tastiness has been reversed in the Netherlands. In further studies the relation between healthiness and tastiness ought to be investigated with people from different cultural backgrounds, so that healthy eating can be encouraged effectively in all countries.

In addition, one factor was demonstrated to impact the tastiness of unhealthy food more than that of healthy food, namely hunger level. This finding is not striking, since multiple studies have already indicated that hunger increases the attractiveness of unhealthy food options (Lozano, Crites, Aikman, 1999; Siep et al., 2009) and enhances the probability of selecting these options (Read & Van Leeuwen, 1998; Tuorila, Kramer & Engell, 2001), since they are

perceived as more rewarding than healthy food (Cheval, Audrin, Sarrazin, Pelletier, 2017). Future studies have to discover more factors that affect the tastiness of healthy and unhealthy food, so that the influence of tastiness in food choices can become more evident.

Moreover, this study investigated whether unhealthy food had a higher purchase intention than healthy food. This hypothesis was not supported. Even though the means suggested a trend in the right direction, purchase intention was not demonstrated to be higher for unhealthy food than for healthy food. Previous studies did find a significant difference between healthy and unhealthy food for purchase intention (Fenko et al., 2016), and this study definitely moves towards the same trend. The reason that no differences were found might be caused by the fact that the credibility of the advertisements was higher for healthy food than for unhealthy food, causing the purchase intention to be higher for healthy food than if the credibility of both conditions was similar. In addition, healthy eaters prefer purchasing healthy food over unhealthy food, regardless of the fact that they might consider it as tastier. Therefore, it is logical that the effect of the healthiness of the food on purchase intention is mitigated compared to tastiness.

In this study, purchase intention for unhealthy food was found to be higher than for healthy food when the participant's hunger level was high. This is in line with another Dutch study, in which students were demonstrated to purchase more unhealthier food items the hungrier they were (Nederkoorn, Guerrieri, Havermans, Roefs & Jansen, 2009). Given that the tastiness is the predominant factor in selecting food and since that factor becomes more vigorous when one is hungry, as described before, it is logical that people purchase more frequently tastier meals when being hungry. And since unhealthy meals are considered as tastier, the purchasing of unhealthy meals increases accordingly. However, this bad habit can lead to the overconsumption of unhealthy food. Therefore, it is essential to discover how healthy food purchasing can be fostered, so that the consumption of unhealthy food will be discouraged. Future studies have to investigate more factors that can encourage healthy food purchasing.

In this study, one of the factors that could presumably stimulate people to purchase healthier food is bundling, as showed by a study in the United States. Bundling means that instead of choosing a very delicious dish, a consumer would select a bit less delicious dish to, at least, have a healthier meal (Carroll, Samek & Zepeda, 2018). Relating that to the variables in this study, the purchase intention of indulgently framed healthy food would be higher than of indulgently framed unhealthy food, since, even though healthy food is perceived as less tasty, it also has the healthiness connotation. However, this theory of bundling was not supported in the Netherlands. A possible explanation, for instance, could be that the Dutch, concerning food,

may prefer pursuing either tastiness or healthiness and do not like to compensate tastiness for healthiness or inversely. However, it is not clear why bundling is found to be a strategy to encourage healthy eating in the United States, although not in the Netherlands. Future research has to demonstrate what variables can influence selecting a bundled option, and to what extent bundling can be employed to encourage healthy eating.

Limitations

In this study there were a couple of limitations. In first place, it is reasonable to question the validity of the Unhealthy = Tasty Intuition. In order to examine whether the healthiness and the tastiness are negatively correlated, the healthiness of the dish must also be evaluated (Raghunathan et al., 2006). In other words, to investigate the existence of this correlation more accurately, the dishes should not be divided in categories, but instead should be presented on a scale, on which the healthiness of the dish can be rated. However, this is a complicated process, since the scores of the tastiness and healthiness evaluations tend to be fluid over time and in the study only a snapshot of that fluidity of perceptions is being examined (Raghunathan et al., 2006), implying that, for instance, when consumer perceives a pizza at point A as healthier than at point B, the tastiness should be adjusted accordingly. This might be an interesting topic to look at in future research.

Furthermore, it is difficult to discover whether the differences in the tastiness were caused by the level of healthiness of the food. The images accompanied by the text probably also affect the food choice. In first place, since most advertisements for unhealthy food focus on taste (Moon, 2010), it is very probable that the images for unhealthy food in this experiment were perceived as tastier than those for the healthy dishes, merely because of the image. On top of that, given that for each meal a different image was chosen, it is not clear if one exerted a greater influence than another. If one would have chosen to compare a hamburger with a veggie burger with the same images, the effect of the image would be outweighed, and in that case only verbally the advertisement could influence the perceptions of tastiness and the willingness to pay more. Since in this research the effect of the descriptions was investigated, we assumed that differences across the images would have little importance. However, future studies on the influence of language on food choices should either include the same images for healthy and unhealthy food or exclude the images, so that merely the effect of the language can be investigated. It might be interesting, in that case, to additionally include other food choice influencers such as convenience and price, so that the role of language on food choices will become clearer.

This study aimed to get a better understanding of how focussing on the tastiness of the dish could be used to promote healthy eating. While this study did not show that, in the Netherlands, healthy eating could be improved by focussing on taste, other methods have to be discovered to improve healthy food perceptions. By doing so, hopefully, one day healthy food options will be preferred over unhealthy dishes.

References

- Aspillaga, H. C., Cruzat, M. C., Torres, A. M., Haemmerli, D. C., Pérez, V. C., García, T. A., Díaz, B. M., ..., & Gana, R. C. (2012). Vivencias subjetivas de adolescentes con obesidad respecto a su tratamiento. *Revista Chilena de Nutrición*, 39(2), 191-199.
- Bandyopadhyay, S., Kindra, G., & Sharp, L. (2001). Is television advertising good for children? Areas of concern and policy implications. *International Journal of Advertising*, 20, 89-116.
- Bouhlef, O., Mzoughi, N., Ghachem, M. S., & Negra, A. (2010). Online purchase intention. *International Journal of E-Business Management*, 4(2), 37-51.
- Bialkova, S., Grunert, K. G., & van Trijp, H. (2013). Standing out in the crowd: The effect of information clutter on consumer attention for front-of-pack nutrition labels. *Food Policy*, 41, 65-74.
- Bialkova, S., Sasse, L., & Fenko, A. (2016). The role of nutrition labels and advertising claims in altering consumers' evaluation and choice. *Appetite*, 96, 38-46.
- Boichat, J. M. (2014). *Surpoids et obésité, prévention à l'école* (Doctoral dissertation, Haute école pédagogique BEJUNE).
- Breslin, P. A. (2013). An evolutionary perspective on food and human taste. *Current Biology*, 23(9), 409-418.
- Cadario, R., & Chandon, P. (2019). Which healthy eating nudges work best? A meta-analysis of field experiments. *Appetite*, 130, 300-301.
- Cairns, G., Angus, K., Hastings, G., & Caraher, M. (2013). Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. *Appetite*, 62, 209-215.
- Campos, S., Doxey, J., & Hammond, D. (2011). Nutrition labels on pre-packaged foods: a systematic review. *Public health nutrition*, 14(8), 1496-1506.
- Cardello, A. V., & Schutz, H. G. (1996). Food appropriateness measures as an adjunct to consumer preference/acceptability evaluation. *Food Quality and Preference*, 7(3-4), 239-249.
- Carroll, K. A., Samek, A., & Zepeda, L. (2018). Food bundling as a health nudge: Investigating consumer fruit and vegetable selection using behavioral economics. *Appetite*, 121, 237-248.
- Chandon, P., & Wansink, B. (2007). The biasing health halos of fast-food restaurant health claims: lower calorie estimates and higher side-dish consumption intentions. *Journal of Consumer Research*, 34(3), 301-314.
- Charles, N. & Kerr, M. (1988). *Women, Food and Families*. Manchester, United Kingdom: Manchester University Press.
- Chen, X., Jahns, L., Gittelsohn, J., & Wang, Y. (2012). Who is missing the message? Targeting strategies to increase food label use among US adults. *Public health nutrition*, 15(5), 760-772.
- Cheval, B., Audrin, C., Sarrazin, P., & Pelletier, L. (2017). When hunger does (or doesn't) increase unhealthy and healthy food consumption through food wanting: The distinctive role of impulsive approach tendencies toward healthy food. *Appetite*, 116, 99-107.

- Dean, M., Raats, M. M., & Shepherd, R. (2008). Moral concerns and consumer choice of fresh and processed organic foods. *Journal of Applied Social Psychology*, 38(8), 2088–2107.
- Dutta-Bergman, M. J. (2004). Reaching unhealthy eaters: Applying a strategic approach to media vehicle choice. *Health Communication*, 16(4), 493-506.
- Entman, R. M. (2004). *Projections of Power: Framing News, Public Opinion, and U.S. Foreign Policy*. Chicago, IL: University of Chicago Press.
- Fenko, A., Kersten, L., & Bialkova, S. (2016). Overcoming consumer scepticism toward food labels: The role of multisensory experience. *Food quality and preference*, 48, 81-92.
- Finkelstein, S. R., & Fishbach, A. (2010). When healthy food makes you hungry. *Journal of Consumer Research*, 37(3), 357-367.
- Fischler, C., & Masson, E. (2008). *Manger: Français, Européens et Américains Face à L'alimentation*. Paris, France: Éditions Odile Jacob
- Flegal, K. M., Carroll, M. D., Kuczmarski, R. J., & Johnson, C. L. (1998). Overweight and obesity in the United States: prevalence and trends, 1960–1994. *International journal of obesity*, 22(1), 39-47.
- Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *Jama*, 303(3), 235-241.
- Grabenhorst, F., Schulte, F. P., Maderwald, S., & Brand, M. (2013). Food labels promote healthy choices by a decision bias in the amygdala. *NeuroImage*, 74, 152–163.
- Gracia, A., & Albisu, L. M. (2001). Food consumption in the European Union: main determinants and country differences. *Agribusiness: an international journal*, 17(4), 469-488.
- Hallak, R., Lee, C., & Onur, I. (2019). Examining healthy beverages in the hospitality industry: evidence from Australia and New Zealand. *British Food Journal*, 122(2), 365-379.
- Hawkes, C., Smith, T. G., Jewell, J., Wardle, J., Hammond, R. A., Friel, S., ..., & Kain, J. (2015). Smart food policies for obesity prevention. *The Lancet*, 385(9985), 2410-2421.
- Hur, J., & Jang, S. S. (2015). Consumers' inference-dynamics about healthy menu promotions in a bundle context. *International Journal of Hospitality Management*, 44, 12-22.
- Jiang, Y., Wang, H. H., Jin, S., & Delgado, M. S. (2019). The Promising Effect of a Green Food Label in the New Online Market. *Sustainability*, 11(3), 796.
- Jo, J., & Lusk, J. L. (2018). If it's healthy, it's tasty and expensive: Effects of nutritional labels on price and taste expectations. *Food quality and preference*, 68, 332-341.
- Jo, J., Lusk, J. L., Muller, L., & Ruffieux, B. (2016). Value of parsimonious nutritional information in a framed field experiment. *Food policy*, 63, 124-133.
- Keller, K. L., Sternthal, B., & Tybout, A. (2002). Three questions you need to ask about your brand. *Harvard business review*, 80(9), 80-89.

- King, S. C., Weber, A. J., Meiselman, H. L., & Lv, N. (2004). The effect of meal situation, social interaction, physical environment and choice on food acceptability. *Food Quality and Preference*, 15(7–8), 645–653.
- Lähteenmäki, L., Lampila, P., Grunert, K., Boztug, Y., Ueland, Ø., Åström, A., & Martinsdóttir, E. (2010). Impact of health-related claims on the perception of other product attributes. *Food Policy*, 35(3), 230-239.
- Levy-Navarro, E. (2008). *The culture of obesity in early and late modernity: Body image in Shakespeare, Jonson, Middleton, and Skelton*. Springer.
- Lozano, D. I., Crites, S. L., & Aikman, S. N. (1999). Changes in food attitudes as a function of hunger. *Appetite*, 32(2), 207-218.
- Luomala, H., Jokitalo, M., Karhu, H., Hietaranta-Luoma, H. L., Hopia, A., & Hietamäki, S. (2015). Perceived health and taste ambivalence in food consumption. *Journal of Consumer Marketing*, 32(4), 290- 301.
- Magee, S., & Hennessy-Priest, K. (2014). Gender differences amongst Coventry University students in how perception of palatability changes when a food is described as healthy. *European Journal of Nutrition & Food Safety*, 4(3), 183-184.
- Meiselman, H. L. (2007). The impact of context and environment on consumer food choice. In L. Frewer & H. van Trijp (Eds.), *Understanding consumers of food products* (pp. 67–92). Cambridge, United Kingdom: Woodhead Publishing.
- Moon, Y. S. (2010). How food ads communicate ‘health’ with children: A content analysis of Korean television commercials. *Asian Journal of Communication*, 20(4), 456-476.
- Nederkoorn, C., Guerrieri, R., Havermans, R. C., Roefs, A., & Jansen, A. (2009). The interactive effect of hunger and impulsivity on food intake and purchase in a virtual supermarket. *International journal of obesity*, 33(8), 905-912.
- Newson, R. S., Van der Maas, R., Beijersbergen, A., Carlson, L., & Rosenbloom, C. (2015). International consumer insights into the desires and barriers of diners in choosing healthy restaurant meals. *Food Quality and Preference*, 43, 63-70.
- Nørgaard, M. K., & Brunsø, K. (2009). Families’ use of nutritional information on food labels. *Food Quality and Preference*, 20(8), 597-606.
- Norton, P. A., Falciglia, G. A. & Ricketts, C. (2000) Motivational determinants of food preferences in adolescents and pre-adolescents. *Ecology of Food and Nutrition*, 39, 169–182.
- Ogden, C. L., Carroll, M. D., Curtin, L. R., Lamb, M. M., & Flegal, K. M. (2010). Prevalence of high body mass index in US children and adolescents, 2007-2008. *Jama*, 303(3), 242-249.
- Pachucki, M. (2014). Alimentation et réseau social: une étude sur «le goût par nécessité» en contexte social. *Sociologie et sociétés*, 46(2), 229-252.
- Pornpitakpan, C. (2004). The persuasiveness of source credibility: A critical review of five decades’ evidence. *Journal of Applied Social Psychology*, 34(2), 243–281.

- Pinto, V. R. A., Freitas, T., de Souza Dantas, M. I., Della Lucia, S. M., Melo, L. F., Minim, V. P. R., & Bressan, J. (2017). Influence of package and health-related claims on perception and sensory acceptability of snack bars. *Food Research International*, 101, 103-113.
- Prendergast, G. P., Tsang, A. S., & Chan, C. N. (2010). The interactive influence of country of origin of brand and product involvement on purchase intention. *Journal of Consumer Marketing*, 27(2), 180-188
- Raats, M. M., Shepherd, R., & Sparks, P. (1995). Including moral dimensions of choice within the structure of the theory of planned behavior. *Journal of Applied Social Psychology*, 25(6), 484–494
- Raghunathan, R., Naylor, R. W. & Hoyer, W. D. (2006). The unhealthy tasty intuition and its effects on taste inferences, enjoyment, and choice of food products. *Journal of Marketing*, 70, 170 –184.
- Read, D., & Van Leeuwen, B. (1998). Predicting hunger: The effects of appetite and delay on choice. *Organizational behavior and human decision processes*, 76(2), 189-205.
- Ricci, E. C., Banterle, A., & Stranieri, S. (2018). Trust to go green: an exploration of consumer intentions for eco-friendly convenience food. *Ecological economics*, 148, 54-65.
- Roininen, K., Tuorila, H., Zandstra, E. H., de Graaf, C., Vehkalahti, K., Stubenitsky, K., & Mela, D. J. (2001). Differences in health and taste attitudes and reported behaviour among Finnish, Dutch and British consumers: a cross-national validation of the Health and Taste Attitude Scales (HTAS). *Appetite*, 37(1), 33-45.
- Rozin, P., Fischler, C., Imada, S., Sarubin, A., & Wrzesniewski, A. (1999). Attitudes to food and the role of food in life in the USA, Japan, Flemish Belgium and France: Possible implications for the diet–health debate. *Appetite*, 33(2), 163-180.
- Shepherd, R., & Raats, M. (Eds.). (2006). *The psychology of food choice*. Cambridge, MA: CABI.
- Siep, N., Roefs, A., Roebroek, A., Havermans, R., Bonte, M. L., & Jansen, A. (2009). Hunger is the best spice: an fMRI study of the effects of attention, hunger and calorie content on food reward processing in the amygdala and orbitofrontal cortex. *Behavioural brain research*, 198(1), 149-158.
- Suher, J., Raghunathan, R., & Hoyer, W. D. (2016). Eating healthy or feeling empty? How the “healthy=less filling” intuition influences satiety. *Journal of the Association for Consumer Research*, 1(1), 26-40.
- Swenson, M. R., & Wells, W. D. (1995). Target marketing for health communication. *Social Marketing Quarterly*, 2(1), 5–9.
- Thomsen, T. U., & Hansen, T. (2015). Perceptions that matter: perceptual antecedents and moderators of healthy food consumption. *International Journal of Consumer Studies*, 39(2), 109-116.
- Tuorila, H., Kramer, F. M., & Engell, D. (2001). The choice of fat-free vs. regular-fat fudge: the effects of liking for the alternative and the restraint status. *Appetite*, 37(1), 27-32.

- Turnwald, B. P., & Crum, A. J. (2019). Smart food policy for healthy food labelling: Leading with taste, not healthiness, to shift consumption and enjoyment of healthy foods. *Preventive Medicine*, 119, 7-13.
- Turnwald, B. P., Jurafsky, D., Conner, A., & Crum, A. J. (2017). Reading between the menu lines: Are restaurants' descriptions of "healthy" foods unappealing? *Health Psychology*, 36(11), 1034–1037
- Tversky A., & Kahneman D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453-458.
- Verbeke, W. (2006). Functional foods: Consumer willingness to compromise on taste for health?. *Food quality and preference*, 17(1-2), 126-131.
- Verhoef, P. C. (2005). Explaining purchases of organic meat by Dutch consumers. *European Review of Agricultural Economics*, 32, 245–267.
- Wansink, B., & Chan, N. (2001). Relation of soy consumption to nutritional knowledge. *Journal of Medicinal Food*, 4(3), 145-150.
- Wellard, L., Glasson, C., & Chapman, K. (2012). Sales of healthy choices at fast food restaurants in Australia. *Health Promotion Journal of Australia*, 23(1), 37-41.
- Werle, C. O., Trendel, O., & Ardito, G. (2013). Unhealthy food is not tastier for everybody: The "healthy= tasty" French intuition. *Food Quality and Preference*, 28(1), 116-121.
- Yeomans, M. R. (2007). Psychobiological mechanisms in food choice. In H. MacFie (Ed.), *Consumer-led food product development Cambridge* (1st edition) (pp. 81-107). Cambridge, UK: Woodhead Publishing Limited.

Appendix 1 - Materials

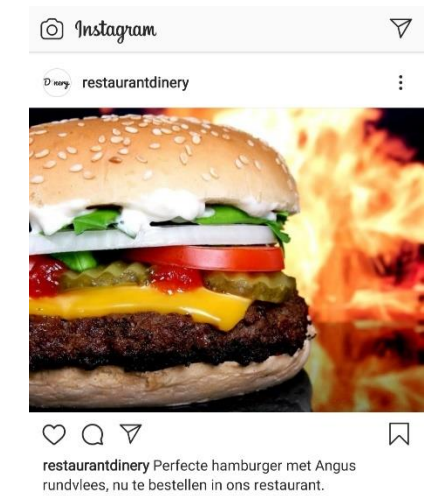
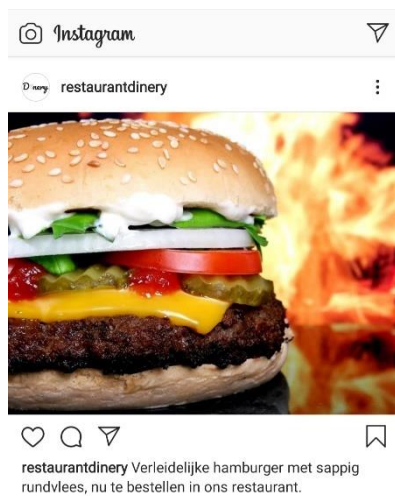
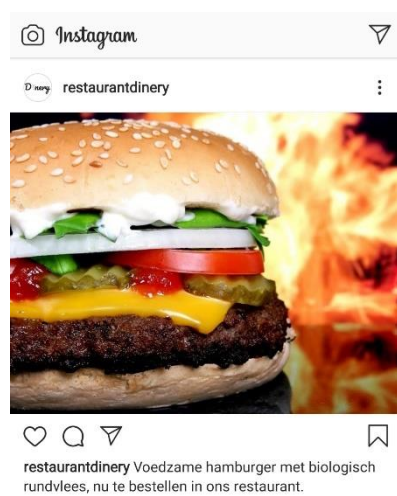
Health frame

Unhealthy food

Pizza



Hamburger



Nachos



Healthy food

Salad



Vegetable curry



Salmon

